

Utah Department of
Agriculture & Food
350 North Redwood Rd
P.O. Box 146500
Salt Lake City, UT 84114

**MEDICAL CANNABIS
Independent Lab
ESTABLISHMENT APPLICATION
CHECKLIST**

Website: www.ag.utah.gov Phone:
801-982-2200
Email: cannabis@utah.gov

The Application submitted by a Cannabis Processing Facility and approved by the Establishment Board will be considered the business's operation plan. UDAF Inspectors will use the operation plan for regulatory purposes. Ensure all information is complete, current, and accurate.

The information provided by the applicant for a Medical Cannabis Production Establishment must fit within the following Guidelines: a) Maximum 50 pages
b) Information provided must be clear and concise; do not repeat information
c) Ensure each section speaks to the requested information; and are in the same order as application d) Everything in the application is contained in a single PDF document.

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Medical Cannabis Program

Application Number: _____
(office use only)

An independent testing laboratory license allows the licensee to:

- a) Receive cannabis from a licensed cannabis cultivation facility to conduct testing as required by section 4-41a-701(2) and Utah Admin. Code R68-29.
- b) Receive cannabis from a licensed cannabis processing facility to conduct testing as required by section 4-41a-701(2) and Utah Admin. Code R68-29.
- c) Receive cannabis from a licensed cannabis cultivation facility and a cannabis processing facility to conduct the additional test as requested.

An Independent Testing Laboratory must pay a yearly licensing fee of \$15,000.00

Ownership Information

1. Ownership Entity:

Type: Individual Partnership Corporation x Limited Liability Company Entity

2. DBA: (assumed name of business) **Aromatic Plant Research Center**

3. Facility Address: **230 North 1200 East STE 100** **Lehi UT** **84043** STREET
CITY STATE ZIP 4. Mailing Address:

(IF DIFFERENT) STREET CITY STATE ZIP

5. Business Phone: **385-484-8300** Fax: **N/A** Other/office: _____

6. Contact Person: **Aaron Sorensen** Phone number: **812-406-3297** Email: **asorensen@aromaticplant.org** 7.

Manager: **William Deutschman** Phone number: **385-484-8302** Email: **wdeutschman@aromaticplant.org** 8.

Does the Independent Laboratory also do Industrial Hemp testing? **Yes:**

9. Does this Independent Laboratory affiliated with any other Medical Cannabis Licenses? **No**

Ownership Information

An owner is a person who, if the company is privately held, has a financial **or voting interest** of 2% or greater in the cannabis production establishment; or if the entity is publicly traded has more than a 2% financial interest in the company; or is an individual who has the power to direct or cause the management or control of a facility, in other words is a general manager of daily operations.

List all Owners and their positions in the Company.

Legal Name (First & Last)	Role in the Company's Finances and Decisions	Listed on initial Application (Yes/ No)	Agent Card (Yes/ No)
Aaron Sorensen	CEO – Management and Control	Yes	Yes
Prabodh Satyal	CSO – Management and Control	Yes	Yes

10. The applicant understands that as an applicant and potential licensee you are required to know the current statutory law, administrative rules and Departmental policies and comply in full? **Yes x No**
11. An independent testing laboratory shall employ a Scientific Director. A copy of degrees and a resume with references must be submitted with application to provide proof that the scientific director meets one of the following requirements: A. Doctorate degree in chemical or biological sciences from an accredited college or university and have at least 2 years of post-degree laboratory experience
- B. Master's degree in chemical or biological sciences from an accredited college or university and have at least 4 years of post-degree laboratory experience.
- C. Bachelor's degree in chemical or biological sciences from an accredited college or university and have at least 6 years of post-degree laboratory experience
12. Ownership / Management information, Utah Code 4-41a-204(b)
- A. Descriptions of the credentials and experience of each Owner who has a financial or voting interest of 2% or greater and/or has direct decision making power over the cannabis production establishment.
Aaron Sorensen and Dr. Prabodh Satyal are the owners of APRC. Resumes for each are included in the attachments.
- B. Provide a description of any investigation or adverse action taken by any licensing jurisdiction, government agency, law enforcement agency, or court in any state for any violation or detrimental conduct in relation to any of the applicant's cannabis-related operations or businesses.
All warning letters or citations are included in the attached documents.

Laboratory Facility Information

13. Laboratory's Hours of Operation: **Monday – Friday, 9:00 a.m. – 5:00 p.m.**

Laboratory Establishment Property Information

14. Submit a Blueprint with the following:
- a) total square footage of the overall cannabis testing area;
 - b) location of toilet facilities;
 - c) location of handwashing facilities;
 - d) location of a break room;
 - e) location of personal lockers;
 - f) location of the areas to be used for receiving samples;
 - g) Show how areas of the facility are compartmentalized based on functionality; and
 - h) the location of all security cameras and external lights.

Operation Plan

15. Submit, physical characteristics of the proposed facility, including a floor plan and an architectural elevation and written explanation:
16. Include a proposed Fee Schedule for all testing and services offered to Medical Cannabis Production Establishments. 17. Submit the proposed independent cannabis testing laboratory's written standard operating procedures for each test to be conducted. Provide the proposed independent cannabis testing laboratory's intended:
- A. cannabis and cannabis product testing capability;
Cannabinoid content (using HPLC-DAD) in cannabis and cannabis products
Residual solvents (using GCMS) in cannabis and cannabis products

Terpene content (using GCMS) in cannabis and cannabis products
Moisture content (using a moisture content balance) in cannabis and cannabis products
Water activity (using a water activity meter) in cannabis and cannabis products
Quantitative microbial measurement (using Hardy Compact Dry Plates and 3M Petrifilm) for total aerobic content and total yeast and mold, in cannabis and cannabis products
Detection of pathogenic organisms (using PCR based techniques) in cannabis and cannabis products
Presence of pesticides (using LCMS) in cannabis and cannabis products
Presence of heavy metals (using ICP-MS) in cannabis and cannabis products

B. cannabis and cannabis product testing equipment;

Shimadzu LC2030C HPLC with Diode Array Detector

Shimadzu QP2020 GCMS

Sartorius MA-37

Meter Group Aqualab 3

Shimadzu LCMS 8050

Agilent 7800 ICPMS

C. testing methods, standards, practices, and procedures for testing cannabis and cannabis products.

Copies of our SOPs are attached for each of the testing methods noted above.

18. Provide an update on the Lab's progress in obtaining and keeping an International Organization for Standardization (ISO) 17025:2017 accreditation.

Please see attached report from our ISO 17025:2017 for last year, Certificate No: L22-380. We've completed this years audit and are awaiting the final issuance of the certification from Perry Johnson. The result of the audit was that we were in full compliance with the requirements of the ISO 17025:2017 standard. The auditor reported zero non-compliances and zero minor findings. At this time, no follow-up actions, no procedural changes, and no additional documentation is required for finalization of our ISO certification.

19. Submit the laboratories adopted minimum good laboratory practices which satisfy the OECD Principles of Good Laboratory Practice and Compliance Monitoring, published by the Organization for Economic Co-operation and Development. The APCR quality manual is longer than the 50 page limit for this application, so we have not attached it here. It is available upon request. Our quality Management System was reviewed by our Perry Johnson auditor as part of our ISO certification process. His comment to us was, "That is one of the best QMS's I have ever seen." As part of the ISO certification process, our auditor reviewed the QMS (and our records supporting compliance) point-by-point to assure that we were following the guidelines contained in it. Once again, he found zero non-compliances and zero minor findings. This indicates that our current laboratory practices meet both the ISO 17025:2017 standard and standard Good Laboratory Practices.

20. Provide the Lab's procedure for notifying the cannabis production facility and the Department of failed Quality Assurance Testing sample.

When uploading testing results to MJ Freeway, the office manager will send an email to both UDAF and the cannabis production facility of the sample that failed. The email will include the sample name, batch ID, and any testing information for that sample. The results will be attached to the email.

21. Provide the proposed independent cannabis testing laboratory's storage protocols, both short and long-term, to ensure all cannabis is stored in a manner that is sanitary and preserves the integrity of the cannabis.

See SOP: Sample Handling Receiving Inventory Storage and Retains.

Samples are stored for a minimum of 60 days in a secured retains room or for microbial testing, in a locked refrigerator. The samples are kept off the floor and in locked storage bins. Each bin is labeled with the dates.

22. Provide all written emergency procedures for Fire, Chemical Spills, and other Emergencies. *This information plus the Material Safety Data Sheet (MSDS) must be easily accessed by all employees.*

See SOP: APRC Lab Safety Waste Disposal and Chemical Hygiene Plan

23. Submit the proposed independent cannabis testing laboratory's waste disposal plan. Explain how the laboratory will operate in a facility that meets all requirements of Utah Code 4-41a-405 Excess and disposal and Utah Administrative Rule R68-30-9 Cannabis waste disposal.

See SOP: Sample Handling Receiving Inventory Storage and Retains.

After the sample(s) have been retained for a minimum of 60 days, each mylar bag is weighed and entered into the disposal log. Each individual unit is opened and put in biohazard waste bags with insulated or garbage material and autoclaved for 20 minutes.

24. Submit the proposed independent cannabis testing laboratory's security plan. Explain how the laboratory will operate in a facility that meets all security requirements in Utah Administrative Rule R68-30-5.

See SOP: APRC Lehi Security

Compliance

25. Provide proof of a \$50,000 performance bond that a surety business in the state issues. This can be done after and intent to license has been issued.
26. Submit a current local business license or permit from the city/municipality.
27. Submit the names of all agents currently working at the company's processing facility. All agents listed must: a) be in the process of applying for an agent card in the EVS; or
b) have an agent card and have an account in the EVS.

Aaron Sorensen

Prabodh Satyal

William Deutschman

Jordan Morley

Cierra Gunn

Riley Hunter

Ambika Poudel

Tessa Siler

Sophie Pearson

Heidi Kipp

The Facility is responsible for ensuring all employees have background checks and are registered in the EVS. The company is also responsible for collecting agent cards and notifying the Department when an agent leaves their facility. Failure to comply will result in a citation and a fine to the company.

License Disclaimer

Licensee understands the current statute and rules are subject to change. Licensees agrees as a condition of licensing that they have read and will abide by the provisions of Utah Code 4-41a and all rules promulgated there under all directives of the Utah Department of Agriculture and Food. The licensee also understands that failure to adhere to or maintain the qualifications of their license, may result in suspension or revocation of the license and/or forfeiture of the performance bond or any other remedies allowed by law.

Licensee agrees to immediately notify the department of any change in ownership or financial interest of the facility; the facility's name, change in location, change in equipment, remodeling, expansion, reduction or physical non-cosmetic alteration of the facility, change in written operating procedures, or change in any information submitted in this

application in accordance with Utah Administrative Rule 68-27-13.

The undersigned acknowledges that representatives of the Utah Department of Agriculture and Food may inspect the records and facility of a cannabis production establishment at any time during business hours to determine and ensure the cannabis production establishment is in compliance with the law. Failure to provide the department or the department's authorized agent's immediate access to records and facilities during business hours in accordance with this section may result in a civil monetary penalty; license or registration suspension or revocation; or an immediate cessation of operations under a cease and desist order issued by the department.

Disclaimer

The Licensee acknowledges and understands that cultivating, possessing, using, distributing and/or selling marijuana is prohibited by federal law, notwithstanding Utah law or any authorizations in the Agent or this Registration to the contrary.

Nothing in this Application is intended to provide any guidance or assistance in violating or complying with existing federal laws regulating marijuana cultivation, distribution, or use. Similarly, compliance with state law or the terms of this registration, or possession of the registration card does not confer immunity from enforcement of federal law or federal enforcement practices. Further, nothing in this application or the registration card shall be construed as advice with regards to compliance with applicable federal, state, or local tax laws or any regulatory consequences of engaging in any business in this industry.

The undersigned acknowledges that he/she has read and understands the statements herein and the execution thereof is done voluntarily and by the authorization of the applicant entity.

The undersigned hereby makes application to the Utah Department of Agriculture and Food and certifies that the information contained herein and attached here is true and correct.

Aaron Sorensen Owner CEO
Applicant/Owner of business Title/Position

Aaron Sorensen 5-18-23

Applicant Signature Date

William A Deutschman
333 East Penney Avenue
South Salt Lake, UT 84115
(801) 694-1523
Will.Deutschman@gmail.com

EDUCATION

Ph.D. Biological Chemistry
9/93-5/01 Department of Chemistry and Institute of Molecular Biology
University of Oregon, Eugene, OR 97403
Thesis Advisor: Frederick W. Dahlquist, Ph.D.

B.S. Chemistry
9/88-6/92 Lewis and Clark College, Portland, OR 97219

EMPLOYMENT HISTORY

Lab Director – APRC Lehi

6/21-present

Job responsibilities: Develop and validate all analytical methods. Write all supporting technical documentation required for ISO 17025:2017 certification. Hire, maintain, and train all technical staff. Design and implement QC and internal PT programs to ensure accuracy of instruments, methods, and technician work. Tune and maintain analytical instrumentation.

Professor of Chemistry – Westminster College

8/07 – 12/21

Job Responsibilities: Program chair for 6 years. Teaching classes in chemistry, biology, and brewing science. Supervising program budgets, spearheading program assessment and reviews, developing curriculum, assisting with recruiting, supervising student research, upkeep and repair of scientific instrumentation, training students on proper and safe use of instruments and chemicals, community outreach to local brewers and breweries, presenting research at national and international conferences.

Contractor – QA/QC analysis - Canderella LLC

5/19-11/19

Job Responsibilities: Ensuring consistent product quality and composition, analysis of raw materials, sampling and analyzing intermediate products and waste to ensure consistent production processes, analytical method design, literature review, minor process development, instrument maintenance and repair, record keeping and tracking of process and product variations.

Assistant Professor of Chemistry - SUNY Plattsburgh

9/01-5/07

Job responsibilities: Teaching classes in chemistry and biology, participating in program assessment and reviews, developing curriculum, supervising student research, upkeep and repair of scientific instrumentation, training students on proper and safe use of instruments and chemicals.

RELEVANT SCIENTIFIC INSTRUMENTS AND TECHNIQUES:

HPLC (High Pressure Liquid Chromatography): Analysis of process and waste samples from CBD purification process. Determination of relative abundance of cannabinoids and exact concentrations of CBD and THC. Comfortable with method development and complete maintenance of instrumentation.

GC (Gas Chromatography): Measuring volatile compounds in various analytes. Headspace analysis of esters, vicinal diketones and other flavor/aroma active compounds in beer and distilled beverage samples. Similar methodology could be applied toward terpenes or other flavor/aroma active compounds.

Solvent extraction and sampling of plant matter: Solvent based extraction of cannabinoids from plant material during the growing cycle for quantitative analysis by HPLC. Process development and statistical analysis of differences between plant cultivars and changes in cannabinoid content over the growing cycle.

Misc. Lab Techniques: Sterile technique and cell culture, UV/Vis spectorscopy, IR spectroscopy, Fluorescence spectroscopy, PCR, DNA extraction and sequencing, ELISA assays, electronic lab notebook maintenance and review.

PUBLICATIONS AND PRESENTATIONS

Aaron D Smith, Sam Dulski and William A Deutschman. "Wort sugar utilization during a nine-generation serial repitching experiment." Paper submitted to ASBC journal. Accepted, pending minor revisions.

"Wort sugar utilization during a nine-generation serial repitching experiment."

Aaron D Smith and William A Deutschman. Oral Presentation. *American Society of Brewing Chemists National Conference*, June 2019, New Orleans, LA.

"Quantitative determination of fusel alcohols, ethyl acetate, dimethyl sulfide, and vicinal diketones in craft beer during a nine generation serial repitching experiment."

Bobby T Bruggeman and William A Deutschman. Poster presentation. *American Society of Brewing Chemists National Conference*, June 2019, New Orleans, LA.

"Changes in carbohydrate metabolism in serially repitched yeast." Sam Dulski, William A. Deutschman. Poster Presentation. Master Brewers Conference, October 2017, Atlanta, GA.

"Generation of New Strains of Low-alcohol-producing Brewing Yeast by Selection of Alcohol Dehydrogenase Defective Mutants." LoRe, B. and Deutschman, W.A. Oral presentation. *Biennial Conference on Chemical Education*, July 2016. Greeley, CO.

"Generation of Novel Strains of Low-Alcohol Producing Brewing Yeast by Selection for Alcohol Dehydrogenase Defective Mutants." LoRe, B. and Deutschman, W.A. Poster presentation. *World Brewing Congress International Conference*, July 2016. Denver, CO.

"Determination of Sugar Metabolism Profiles for Non-Traditional Brewing Yeasts of the Genus *Brettanomyces*." Johnson, K. and Deutschman, W.A. Poster presentation. *American Chemical Society National Meeting*, March, 2016. San Diego, CA.

"Determination of Sugar Metabolism Profiles for Non-Traditional Brewing Yeasts of the Genus *Brettanomyces*." Johnson, K. and Deutschman, W.A. Poster presentation. *World Brewing Congress International Conference*, July 2016. Denver, CO.

"Decreasing Ethanol Production in *Saccharomyces cerevisiae* Through Mutagenesis of Alcohol Dehydrogenase Enzyme." LoRe, B. and Deutschman, W.A. Poster presentation. *American Chemical Society National Meeting*, March, 2016. San Diego, CA.

"Determination of Sugar Metabolism Profiles of Non-Traditional Yeasts in the *Saccharomyces* and *Brettanomyces* Families." Cook, J. and Deutschman, W.A. Poster presentation. *American Society of Brewing Chemists National Conference*, June 2015. LaQuinta, CA.

Hooker, P. D.; Deutschman, W. A.; Avery, B. J. "The Biology and Chemistry of Brewing: An Interdisciplinary Course." *J. Chem. Educ.* 2014, **91**, 336–339.

“Metabolic Inhibition in *Saccharomyces cerevisiae*.” Wolf, C., Deutschman, W.A. Poster presentation. *Utah Council on Undergraduate Research Annual Conference*, February 2014. Provo, UT

“Identification of Hop Cultivars Using DNA Melt Curve Profiles.” Kilpatrick, J, Avery, B.. and Deutschman, W.A.. World Brewing Congress. July 2012. Poster presentation.

“Identification of Hop Cultivars Using DNA Melt Curve Profiles.” Kilpatrick, J. and Deutschman, W.A., National Conference on Undergraduate Research Annual Meeting. March 2012. Poster presentation.

Gillespie, Blake and Deutschman, William A., “Brewing Beer in the Laboratory: Grain Amylases and Yeast’s Sweet Tooth.” *J. Chem. Ed.*, (2010) **87:11**, 1244-48

References:

Brian Avery – Former colleague at Westminster College. Can speak to professionalism, scientific knowledge, and teaching/leadership abilities.

Phone: 801-673-0336

Email: nerdcommander@gmail.com

Blake Smith – Supervisor at Canderma and colleague at Westminster college. Can speak to QA/QC and analytical chemistry ability, ability to maintain and repair instrumentation, ability to develop and troubleshoot analytical methods and help with process development.

Phone: 801-355-1085

Email: Blake@twolooseteeth.com

Other references available upon request.

UNIVERSITY OF OREGON



On recommendation of the Faculty and the

GRADUATE SCHOOL

*and by authority of the State of Oregon, the State Board of Higher Education
confers upon*

WILLIAM A. DEUTSCHMAN

the degree of

DOCTOR OF PHILOSOPHY

at Eugene, Oregon, on June 16, 2001, with all the rights and privileges appertaining to that degree

Donna W. She
CHANCELLOR

Dave Johnmeyer
PRESIDENT OF THE UNIVERSITY

DR. R. M. Lawrence
PRESIDENT OF THE BOARD

Richard W. Fain
DEAN, GRADUATE SCHOOL

Aaron C. Sorensen

193 E 1570 N Orem, UT 84057

ASorensen@aromticplant.org ~ Mobile: 812-406-3297

Introduction

- ❑ Executive with experience in Sourcing, Laboratory, R&D, Quality Assurance and overall business management in the dietary supplement, cosmetic, essential oil, extracts and food production industry.
- ❑ Broad knowledge and practice with FDA and other nation and international governing regulations including CFR, cGMP, HACCP, ISO and CAPA.

Education

PhD in Biochemistry and Molecular Biology, University of Miami, Miami, FL- anticipated graduation 2022.

Microbiology, post-graduate work at Utah Valley University, Orem, UT- 2010.

Masters of Science, Colorado Technical University, Colorado Springs, CO- 2008.

Bachelor of Science in Chemistry and Material Engineering, University of Utah, SLC, UT- 2005.

Associate of Physical Science, Utah Valley University, Orem, UT- 2003.

Experience

Aromatic Plant Research Center. Lehi, UT 2017-Present.

Founder, CEO

Founded Aromatic Plant Research Center which is a testing and research entity focused on Aromatic Plants and the various extracts, essential oils and other natural products they produce. Two locations in Utah with variety of clients from around the globe. Recent expansion of testing and research offering to include cannabis products.

Alchemy Aromatics. New Albany, IN 2012-2017.

Chief Operations Officers

Oversaw all company operations including Sourcing, Manufacturing, Accounting, Inventory Management and Laboratory operations. Took company from a start-up to doing \$80MM in sales annually.

XANGO, LLC. Lehi, UT 2007-2012.

Sr. Manager, Quality Assurance

Department head, directly responsible for all quality aspects of each product. Report to the CFO while working on an executive level with the VP of operations, Director of Supply Chain and R&D Director to manage procurement, supply chain, quality and risk assessment.

Chemist and Lab Manager, Quality Assurance

Team Lead with Quality Assurance responsible for internal and external lab testing, monitoring and responding to customer concerns, internal training and review of production documentation.

Ultradent Products Inc., South Jordan, UT 2005-2007.

Senior Formulation Chemist

Chemist responsible for production and development of various dental products as well as managing daily operations in the department.

Dr. Prabodh Satyal

Ph.D., M.S., M.Sc., B.Sc.

Email psatyal@aromaticplant.org

Objective of Life: To become a renowned scientist in volatile organic compounds analysis.

EDUCATION AND WORK EXPERIENCE

- B.Sc. (Chemistry) from Tribhuvan University, Nepal [8/2001-1/2004]
- MSc (Natural Product Chemistry) from Tribhuvan University, Nepal [3/2004-7/2006]
- Lecturer of Chemistry at Kathmandu University, Dhulikhel, Nepal for 3 years [8/2006-8/2009]
- GTA at Chemisty Dept. Univ of Alabama in Hunstville [8/2009-8/2013]
- Intern position at Volatile Analysis Corporation Huntsville, AL, USA [6/2013-7/2013]
- M.S. Chemistry University of Alabama in Huntsville USA [8/2009-12/2012]
 - Thesis: "Chemical Characterization And Biological Activities of Himalayan Aromatic Medicinal Plants"
 - Advisor: Prof. Dr. William N. Setzer
- PhD in Biotech. Science and Engineering at University of Alabama in Huntsville [8/2012-12/2015]
 - Dissertation: "Development of GC-MS Database of Essential Oil Components by the Analysis of Natural Essential Oils and Synthetic Compounds and Discovery of Biologically Active Novel Chemotypes in Essential Oils"
 - Advisor: Prof. Dr. William N. Setzer
- Senior Research Scientist at Alchemy Aromatics [9/2013-3/2017]
- Senior Director of Essential Oil Quality & Research at dōTERRA [3/2017-4/2018]
- Chief Scientific Officer at Aromatic Plant Research Center [4/2018-present]

MEMBERSHIPS

- Society of Economic Botany USA (Chapter Member)
- American Chemical Society, USA (Student Member)
- Nepal Chemical Society, Nepal (Life Member)

ORAL PRESENTATIONS

- "Isolation and structure elucidation of *Lemonoids* from *Cedrella tonduzii*," Eastern Regional Symposium 2011 May, held in Nepal.
- "Biological activities and Chemical Composition of *Artemisa* species from Nepal" presented on Andrews Lester Graduate Symposium on Mississippi State University, USA 2012.
- "Bioactivities and Chemical composition of Himalayan aromatic and medicinal plants" 53rd Annual Meeting of Society of Economic Botany 2012, Frostburg MD.
- "Synergistic Biological Activity and Chemodiversity of Himalayan Medicinal Plants from Nepal" Presented on 42nd International Symposium of Essential Oils Portugal, Lisbon. 2012.
- Alliance of International Aromatherapy (AIA) conference "Organic Chemistry of Essential Oil Adulteration". Colorado, USA 2015.
- What is Natural? 2016 (Jamesburg, NJ, USA) "Current trends in essential oil industry" [14th December 2016]
- Essential Oil International Congress and Expo (EOAI) 2018 (Banglore, India) "Recent Advances in Analysis of Essential oil & its importance for developing countries". [August 4th 2018].
- 30th International Symposium on The Chemistry of Natural Products (Athens, Greece) "Challenges in essential oil authentication" 25-29 November 2018.
- IFEAT 2019 [Bali, Indonesia] "Himalayan Medicinal Plants and Their Biological Activities from Nepal" [Accepted for October 1st 2019]

OTHER PRESENTATIONS:

- "Ab-initio investigation of Ascaridole molecule by using semi-empirical method". 2011, Univ. of Ala. in Huntville
- "Volatile Constituent of *Citrus japonica* from Nepal " 2011 Presented on Huntsville, Alabama, USA

- “Biological activities and chemical composition of *Pinus roxburghii* from Nepal” Presented on Kathmandu Symposia on Advanced Materials, 2011.
- “Chemical composition of volatile constituents of seven different species of the Lauraceae family from Nepal.” Presented on Society of Economic Botany Frostburg, Maryland, USA, 2012.
- “Chemical Composition and Biological Activities of Ten Different Species of Asteraceae family from Nepal”, presented on International Symposium of Essential oil, Portugal, 2012.
- “Studies on the volatile phytoconstituents and Biological Activities of Nepalese Piper betle L.” 100th Indian Science Congress, Kolkata, India, 2013.
- “Chemical composition and biological activities of Blumea lacera essential oil from Nepal” SERMAC ACS 2015, Memphis, TN.
- “Chemotypic study of essential oil composition by agglomerative Hierarchical cluster analysis” American Society of Pharmacognosy 2017, Portland, Oregon.

NOTABLE PUBLICATIONS:

- Sharopov, Farukh S.; Kukaniev, Mukhamadsho A.; Thompson, Rachel M.; Satyal, Prabodh; and Setzer, William N., *Composition and antimicrobial activity of the essential oil of Hyssopus seravschanicus growing wild in Tajikistan*, Der Pharma Chemica, 4, 3, 961-966, 2012, Scholars Research Library.
- Satyal, Prabodh; Paudel, Prajwal; Poudel, Ambika; and Setzer, William N., *Chemical composition and biological activities of essential Oil from leaf and bark of Nyctanthes arbor-tristis L. from Nepal*, Open Access Journal of Medicinal and Aromatic Plants, 3, 1, 1, 2012, Medicinal and Aromatic Plants Association of India.
- Prabodh Satyal, Prajwal Paudel, Kuber Limbu and William N. Setzer, *Leaf Essential Oil Composition of Citrus japonica from Nepal*, Journal of Essential Oil Bearing Plants, 15, 3, 357-359, 2012, Har Krishan Bhalla and Sons.
- Prabodh Satyal, Prajwal Paudel, Ambika Poudel, and William N. Setzer, *Antimicrobial activities and constituents of the leaf essential oil of Lawsonia inermis growing in Nepal*, Pharmacologyonline, 1, 31-35, 2012, Silae.
- Prabodh Satyal and William N Setzer, *Chemical Composition and Biological Activities of Nepalese Piper betle L.*, International Journal of Professional Holistic Aromatherapy, 1, 2, 23-26, 2012, Enhancements Aromatherapy LLC.
- Prabodh Satyal, Noura S. Dosoky, Brittany L, and William N. Setzer. *Chemical Compositions and Biological Activities of Amomum subulatum Essential Oils from Nepal*, Natural Product Communication, 7, 9, 1233-1236, 2012, Natural Product Communications.
- Prabodh Satyal, Prajwal Paudel, Ambika Poudel, and William N. Setzer, *Microbiological Activities of Volatile Constituents of Leucas aspera (Wilde) Link from Nepal*, Journal of Natural Pharmaceuticals, 3, 2, 118-119, 2012, Medknow.
- Prabodh Satyal, Katherine E. Woods, Noura S., and William N. Setzer, *Biological Activities and Volatile Constituents of Aegle marmelos (L.) Corrêa from Nepal*, Journal of Medicinally Active Plants, 1, 3, 114-122, 2012, American Council for Medicinally Active Plants.
- Prabodh Satyal and William N. Setzer, *Bioactivities of Volatile Components from Nepalese Artemisia Species(Link)*, Natural Product Communication, 7, 12, 1651-1658, 2012, Natural Product Communications.
- Prabodh Satyal, Prajwal Paudel, Ganesh Khadka, and William N. Setzer, *Leaf essential oil composition of Kylinga brevifolia Rottb. from Nepal*, Journal of Essential Oil Bearing Plants, 15, 5, 175-178, 2012, Journal of Essential Oil Bearing Plants.
- Prabodh Satyal, Prajwal Paudel, Josna Raut, William N Setzer, *Volatile constituents of Pinus roxburghii from Nepal*, Pharmacognosy Research, 5, 1, 43-48, 2013, Phcog.Net.
- Satyal, Prabodh; Dosoky, Noura S; Poudel, Ambika; and Setzer, William N., *Essential oil constituents and their biological activities from the leaves of Cassia fistula growing in Nepal*, Open Access Journal of Medicinal and Aromatic Plants, 3, 2, 1, 2012, Medicinal and Aromatic Plants Association of India.
- Satyal, Prabodh, *Chemical characterization and biological activities of Himalayan aromatic medicinal plants*, [MS Thesis] 2012, The University of Alabama in Huntsville.
- Prabodh Satyal, Shikha Mallik, Tilak Gautam, and William N. Setzer, *Composition and Bioactivities of Leaf Essential Oil of Cassia tora*, Chemistry of Natural Compounds, 49, 3, 471, 2013, Springer.
- Owolabi, Moses S; Lawal, Oladipupo A; Dosoky, Noura S; Satyal, Prabodh; and Setzer, William N., *Chemical composition, antimicrobial, and cytotoxic assessment of Mitracarpus scaber Zucc.(Rubiaceae) essential oil from southwestern Nigeria*, Am. J. Ess. Oils Nat. Prod., 1, 1, 4-6, 2013.

- Prabodh Satyal, Prajwal Paudel, Ambika Poudel, Bernhard Vogler and William N. Setzer, *Chemical Compositions, Phytotoxicity, and Biological Activities of Acorus calamus Essential Oils from Nepal*, Natural Product Communications, 8, 8, 1179, 2013, Natural Product Communications.
- Prajwal Paudel, Prabodh Satyal, Samjhana Maharjan, Nawal Shrestha & William N. Setzer, *Volatile analysis and antimicrobial screening of the parasitic plant Cuscuta reflexa Roxb. from Nepal*, Natural Product Research, 28, 2, 106-110, 2014, Taylor Francis Online.
- Prajwal Paudel, Prabodh Satyal, Noura S. Dosoky, Samjhana Maharjan and William N. Setzer, *Juglans regia and J. nigra, Two Trees Important in Traditional Medicine: A Comparison of Leaf Essential Oil Compositions and Biological Activities*, Natural Product Communications, 8, 10, 1481-1486, 2013, Natural Product Communications.
- Satyal, Prabodh; Paudel, Prajwal; Lamichhane, Bimala; and Setzer, William N., *Volatile constituents and biological activities of the leaf essential oil of Jasminum mesnyi growing in Nepal*, Journal of Chemical and Pharmaceutical Research, 4, 1, 437-439, 2012.
- Satyal, Prabodh; Paudel, Prajwal; Poudel, Ambika; Dosoky, Noura S.; Pokharel, Kiran Kumar; and Setzer, William N., *Bioactivities and compositional analyses of Cinnamomum essential oils from Nepal: C. camphora, C. tamala, and C. glaucescens*, Natural Product Communications, 8, 12, 2013, SAGE Publications Sage CA: Los Angeles, CA.
- Maria Rosilene Cândido Moreira, Mirian Graciela da Silva Stiebbe Salvadori, Antonia Amanda Cardoso de Almeida, Damião Pergentino de Sousa, Joaquin Jordán, Prabodh Satyal, Rivelilson Mendes de Freitas, and Reinaldo Nóbrega de Almeida, *Anxiolytic-like effects and mechanism of (-)-myrtenol: A monoterpene alcohol*, Neuroscience Letters, 579, 5, 119-124, 2014, Science Direct.
- Machado, Keylla C.; Oliveira, George Laylson S.; de Sousa, Élide BV; Costa, Iwysen Henrique F; Machado, Katia C; de Sousa, Damião Pergentino; Satyal, Prabodh; and de Freitas, Rivelilson Mendes, *Spectroscopic studies on the in vitro antioxidant capacity of isopentyl ferulate*, Chemico-biological Interactions, 225, 47-53, 2015, Elsevier.
- Nunes, Geandra Batista Lima; Costa, Luciana Muratori; Gutierrez, Stanley Juan Chávez; Satyal, Prabodh; and de Freitas, Rivelilson Mendes, *Behavioral tests and oxidative stress evaluation in mitochondria isolated from the brain and liver of mice treated with riparin A*, Life Sciences, 121, 57-64, 2015, Pergamon.
- Pires, Lúcio Fernandes; Costa, Luciana Muratori; de Almeida, Antonia Amanda Cardoso; Silva, Oskar Almeida; Cerqueira, Gilberto Santos; de Sousa, Damião Pergentino; Pires, Rosana Martins Carneiro; Satyal, Prabodh; and de Freitas, Rivelilson Mendes, *Neuropharmacological effects of carvacryl acetate on δ -aminolevulinic dehydratase, Na⁺, K⁺-ATPase activities and amino acids levels in mice hippocampus after seizures*, Chemico-biological Interactions, 226, 49-57, 2015, Elsevier.
- Cavalcanti, Isabella Macário Ferro; Satyal, Prabodh; Santos-Magalhães, Nereide Stela; Rolim, Hercília Maria Lins; Freitas, and Rivelilson Mendes, *Acute toxicity and anticonvulsant activity of liposomes containing nimodipine on pilocarpine-induced seizures in mice*, Neuroscience Letters, 585, 38-42, 2015, Elsevier.
- Satyal, Prabodh and Setzer, William N., *Chemotyping and Determination of Antimicrobial, Insecticidal, and Cytotoxic Properties of Wild-Grown Cannabis sativa from Nepal*, Journal of Medicinally Active Plants, 3, 1, 9-16, 2014.
- Shrestha, Samon; Satyal, Prabodh; Pandit, Gajendra; and Setzer, William N, *Chemical composition of the essential oil from the aerial parts of Chrysanthemum cinerariifolium growing in Nepal*, Am. J. Essent. Oils Nat. Prod., 2, 2, 1-3, 2014.
- Satyal, Prabodh; Maharjan, Samjhana; and Setzer, William N., *Volatile constituents from the leaves, fruits (berries), stems and roots of Solanum xanthocarpum from Nepal*, Natural product communications, 10, 2, 1934578X1501000239, 2015, SAGE Publications Sage CA: Los Angeles, CA.
- Poudel, Ambika; Satyal, Prabodh; and Setzer, William N., *Composition and bioactivities of the leaf essential oil of Ficus religiosa Linn*, American Journal of Essential Oils and Natural Products, 2, 3, 16-17, 2015.
- Satyal, Prabodh; Chhetri, Bhuwan K.; Dosoky, Noura S.; Poudel, Ambika; and Setzer, William N, *Chemical Composition of Nardostachys grandiflora Rhizome Oil from Nepal—A Contribution to the Chemotaxonomy and Bioactivity of Nardostachys*, Natural Product Communications, 10, 6, 1934578X1501000668, 2015, SAGE Publications Sage CA: Los Angeles, CA.
- Satyal, Prabodh; Shrestha, Samon; and Setzer, William N, *Composition and bioactivities of an (E)- β -farnesene chemotype of chamomile (Matricaria chamomilla) essential oil from Nepal*, Natural Product Communications, 10, 8, 1934578X1501000835, 2015, SAGE Publications Sage CA: Los Angeles, CA.
- Shrestha, Samon; Poudel, Ambika; Satyal, Prabodh; Dosoky, Noura S.; Chhetri, Bhuwan K.; Setzer, William N., *Chemical composition and biological activity of the leaf essential oil of Callistemon citrinus from Nepal*, Am J. Essent. Oils Nat. Prod., 3, 1, 29-33, 2015.

- Flatt, Victoria; Campos, Carlos; Kraemer, Maria; Bailey, Brittany; Satyal, Prabodh; and Setzer, William, *Compositional Variation and Bioactivity of the Leaf Essential Oil of Montanoa guatemalensis from Monteverde, Costa Rica: A Preliminary Investigation*, Medicines, 2, 4, 331-339, 2015, Multidisciplinary Digital Publishing Institute.
- Satyal, Prabodh; Chhetri, Bhuwan K.; Dosoky, Noura S.; Shrestha, Samon; Poudel, Ambika; and Setzer, William N., *Chemical composition of Blumea lacera essential oil from Nepal. Biological activities of the essential oil and (Z)-lachnophyllum ester*, Natural Product Communications, 10, 10, 1934578X1501001028, 2015, SAGE Publications Sage CA: Los Angeles, CA.
- Satyal, Prabodh; Paudel, Prajwal; Lamichhane, Bimala; and Setzer, William N, *Leaf essential oil composition and bioactivity of Psidium guajava from Kathmandu, Nepal*, American Journal of Essential Oils and Natural Products, 3, 2, 11-14, 2015.
- Farukh S. Sharopov, Prabodh Satyal, Nasser A. Awadh Ali, Suraj Pokharel, Hanjing Zhang, Michael Wink, Muhammadsho A. Kukaniev, and William N. Setzer; *The Essential Oil Compositions of Ocimum basilicum from Three Different Regions: Nepal, Tajikistan, and Yemen*, Chemistry & Biodiversity, 13, 2, 241-248, 2016, Wiley.
- Joshi, Rakesh; Satyal, Prabodh; and Setzer, William, *Himalayan aromatic medicinal plants: a review of their ethnopharmacology, volatile phytochemistry, and biological activities*, Medicines, 3, 1, 6, 2016, Multidisciplinary Digital Publishing Institute.
- Satyal, Prabodh; Crouch, Rebecca A.; Monzote, Lianet; Cos, Paul; Awadh Ali, Nasser A.; Alhaj, Mehdi A.; and Setzer, William N., *The chemical diversity of Lantana camara: Analyses of essential oil samples from Cuba, Nepal, and Yemen*, Chemistry & Biodiversity, 13, 3, 336-342, 2016.
- Dosoky, Noura; Satyal, Prabodh; Gautam, Tilak; and Setzer, William, *Composition and biological activities of Murraya paniculata (L.) Jack Essential Oil from Nepal*, Medicines, 3, 1, 7, 2016, Multidisciplinary Digital Publishing Institute.
- Sharopov, Farukh S.; Satyal, Prabodh; Setzer, William N.; and Wink, Michael, *Chemical compositions of the essential oils of three Salvia species cultivated in Germany*, Am. J. Essent. Oils Nat. Prod., 3, 1, 26-29, 2015.
- Satyal, Prabodh and Setzer, William N, *Chemical composition of Cryptomeria japonica leaf oil from Nepal*, Am. J. Essent. Oils Nat. Prod., 3, 2, 7-10, 2015.
- Sharopov, F.; Satyal, P.; and Wink, M., *Composition of the essential oil of Ferula clematidifolia*, Chemistry of Natural Compounds, 52, 3, 518-519, 2016, Springer US.
- Satyal, Prabodh and Pappas, Robert S., *First Reporting on the Chemistry and Biological Activity of a Novel Boswellia chemotype: The Methoxy Alkane Frankincense*, Global Journal of Science Frontier Research: B, 16, 2, 1-9, 2016, Global Journal.
- Júnior, Antonio Luiz Gomes; Paz, Marcia Fernanda Correia Jardim; Sobral, André Luiz Pinho; da Conceição Machado, Kátia; Ferreira, Paulo Michel Pinheiro; Satyal, Prabodh; de Freitas, Rivelilson Mendes; and Cavalcante, Ana Amélia de Carvalho Melo, *Clinical Study Serum Oxidative Stress Markers and Genotoxic Profile Induced by Chemotherapy in Patients with Breast Cancer: A Pilot Study*, 2015, 11, 2015.
- Sharopov, F.; Satyal, P.; and Wink, M., *Composition of the Essential Oil of Polychrysus tadshikorum*, Chemistry of Natural Compounds, 52, 3, 523-524, 2016, Springer US.
- Mamadalieva, Nilufar Zokirjonovna; Sharopov, Farukh; Satyal, Prabodh; Azimova, Shahnoz Sadykovna; and Wink, Michael, *Composition of the essential oils of three Uzbek Scutellaria species (Lamiaceae) and their antioxidant activities*, Natural Product Research, 31, 10, 1172-1176, 2017, Taylor & Francis.
- Satyal, Prabodh and Pappas, Robert S., *Antique lavender essential oil from 1945, its chemical composition and enantiomeric distribution*, Natural Volatiles & Essential Oils, 3, 2, 20-25, 2016.
- Satyal, Prabodh; Murray, Brittney; McFeeters, Robert; and Setzer, William, *Essential oil characterization of Thymus vulgaris from various geographical locations*, Foods, 5, 4, 70, 2016, Multidisciplinary Digital Publishing Institute.
- Mamadalieva, Nilufar Z.; Sharopov, Farukh S.; Satyal, Prabodh; Azimova, Shahnoz S.; and Wink, Michael, *Chemical composition of the essential oils of some Central Asian Nepeta species (Lamiaceae) by GLC-MS*, Natural Product Communications, 11, 12, 1934578X1601101229, 2016, SAGE Publications Sage CA: Los Angeles, CA.
- Dosoky, Noura S.; Satyal, Prabodh; Pokharel, Suraj; and Setzer, William N., *Chemical Composition, Enantiomeric Distribution, and Biological Activities of Rhododendron anthopogon Leaf Essential Oil from Nepal*, Natural Product Communications, 11, 12, 1934578X1601101230, 2016, SAGE Publications Sage CA: Los Angeles, CA.
- Satyal, Prabodh; Jones, Tyler; Lopez, Elizabeth; McFeeters, Robert; Ali, Nasser; Mansi, Iman; Al-kaf, Ali; and Setzer, William, *Chemotypic characterization and biological activity of Rosmarinus officinalis*, Foods, 6, 3, 20, 2017, Multidisciplinary Digital Publishing Institute.

- Mekala, Amrutha Bindu; Satyal, Prabodh; and Setzer, William N., *Phytochemicals from the bark of Rhamnus caroliniana*, Natural Product Communications, 12, 3, 1934578X1701200324, 2017, SAGE Publications Sage CA: Los Angeles, CA.
- Sharopov, F.; Valiev, A.; Satyal, Prabodh; Setzer, William N.; and Wink, Michael, *Chemical composition and anti-proliferative activity of the essential oil of Coriandrum sativum L*, Am. J. Essent. Oils Nat. Prod., 5, 1, 11-15, 2017.
- Steinberg, Kelly Marie; Satyal, Prabodh; and Setzer, William N., *Chemical composition of the bark essential oil of Cercis canadensis L.(Fabaceae)*, Am. J. Essent. Oils Nat. Prod., 5, 1, 15-17, 2017.
- Satyal, Prabodh, *Development of GC-MS Database of Essential Oil Components by the Analysis of Natural Essential Oils and Synthetic Compounds and Discovery of Biologically Active Novel Chemotypes in Essential Oils: A Dissertation*, Proquest, 2015, University of Alabama in Huntsville.
- Craft, Jonathan; Satyal, Prabodh; and Setzer, William, *The chemotaxonomy of common sage (Salvia officinalis) based on the volatile constituents*, Medicines, 4, 3, 47, 2017, Multidisciplinary Digital Publishing Institute.
- García, Marley; Scull, Ramón; Satyal, Prabodh; Setzer, William N; and Monzote, Lianet, *Chemical characterization, antileishmanial activity, and cytotoxicity effects of the essential oil from leaves of Pluchea carolinensis (Jacq.) G. Don.(Asteraceae)*, Phytotherapy Research, 31, 9, 1419-1426, 2017.
- Steinberg, Kelly Marie; Satyal, Prabodh; and Setzer, William N, *Bark essential oils of Zanthoxylum clava-herculis and Ptelea trifoliata: Enantiomeric distribution of monoterpenoids*, Natural Product Communications, 12, 6, 1934578X1701200632, 2017, SAGE Publications Sage CA: Los Angeles, CA.
- Satyal, Prabodh and Setzer, William N., *Chemical composition and enantiomeric distribution of monoterpenoids of the essential oil of Abies spectabilis from Nepal*, American Journal of Essential Oils and Natural Products, 5, 1, 22-26, 2017.
- Satyal, Prabodh; Craft, Jonathan; Dosoky, Noura; and Setzer, William, *The chemical compositions of the volatile oils of garlic (Allium sativum) and wild garlic (Allium vineale)*, Foods, 6, 8, 63, 2017, Multidisciplinary Digital Publishing Institute.
- Sharopov, Farukh; Valiev, Abdujabbor; Satyal, Prabodh; Gulmurodov, Isomiddin; Yusufi, Salomudin; Setzer, William; and Wink, Michael, *Cytotoxicity of the essential oil of fennel (Foeniculum vulgare) from Tajikistan*, Foods, 6, 9, 73, 2017, Multidisciplinary Digital Publishing Institute.
- Dudai, Nativ; Shachter, Alona; Satyal, Prabodh; and Setzer, William, *Chemical composition and monoterpenoid enantiomeric distribution of the essential oils from apharesmon (Commiphora gileadensis)*, Medicines, 4, 3, 66, 2017, Multidisciplinary Digital Publishing Institute.
- Satyal, Prabodh; Powers, Chelsea; Parducci, V.; McFeeters, Robert; and Setzer, William, *Chemical Composition, Enantiomeric Distribution, and Antifungal Activity of the Oleoresin Essential Oil of Protium amazonicum from Ecuador*, Medicines, 4, 4, 70, 2017, Multidisciplinary Digital Publishing Institute.
- Sharopov, Farukh; Ahmed, Mansour; Satyal, Prabodh; Setzer, William N.; and Wink, Michael, *Antioxidant Activity and Cytotoxicity of Methanol Extracts of Geranium macrorrhizum and Chemical Composition of its Essential Oil*, Journal of Medicinally Active Plants, 5, 2, 53-58, 2017.
- DeCarlo, Anjanette; Johnson, Stephen; Poudel, Ambika; Satyal, Prabodh; Bangerter, Loren; and Setzer, William N., *Chemical Variation in Essential Oils from the Oleo-gum Resin of Boswellia carteri: A Preliminary Investigation*, Chemistry & Biodiversity, 15, 6, 2018.
- Paudel, Prajwal; Satyal, Prabodh; Dosoky, Noura S; and Setzer, William N., *Chemical composition and biological activity of Centella asiatica essential oil from Nepal*, American Journal of Essential Oils and Natural Products, 5, 4, 5-8, 2017.
- Satyal, Prabodh; Chuong, Nguyen Thi Hong; Pham, Van The; Hung, Nguyen Huy; Hien, Vu Thi; Setzer, William N., *Chemical Composition of the Essential Oils of Pogostemon auricularius, a Vietnamese Medicinal Plant*, Natural Product Communications, 13, 5, 1934578X1801300524, 2018, SAGE Publications Sage CA: Los Angeles, CA.
- Powers, Chelsea; Osier, Jessica; McFeeters, Robert; Brazell, Carolyn; Olsen, Emily; Moriarity, Debra; Satyal, Prabodh; and Setzer, William, *Antifungal and cytotoxic activities of sixty commercially-available essential oils*, Molecules, 23, 7, 1549, 2018, Multidisciplinary Digital Publishing Institute.
- Sharopov, Farukh; Valiev, Abdujabbor; Gulmurodov, Isomiddin; Sobeh, Mansour; Satyal, Prabodh; and Wink, Michael, *Alkaloid Content, Antioxidant and Cytotoxic Activities of Various Parts of Papaver somniferum*, Pharmaceutical Chemistry Journal, 52, 5, 459-463, 2018, Springer US.
- Satyal, Prabodh; Poudel, Ambika; and Setzer, William N., *Variation in the volatile phytochemistry of Ageratum conyzoides*, American Journal of Essential Oils and Natural Products, 6, 2, 7-10, 2018.

- Satyal, Prabodh; Hieu, Ho Viet; Do Thi Lai, Nguyen Thi Bich; Ngoc, Nguyen Huy Hung; and Setzer, William N., *The essential oil compositions of Centratherum punctatum growing wild in Vietnam*, American Journal of Essential Oils and Natural Products, 6, 2, 15-18, 2018.
- Suarez, Andrea Vargas; Satyal, Prabodh; and Setzer, William N., *Volatile Components of the Wood of Spanish Cedar, Cedrela odorata, from Costa Rica*, American Journal of Essential Oils and Natural Products, 6, 3, 27-30, 2018.
- Satyal, Prabodh; Hieu, Ho Viet; Chuong, Nguyen Thi Hong; Hung, Nguyen Huy; Tai, Thieu Anh; Hien, Vu Thi; and Setzer, William N., *Chemical composition, Aedes mosquito larvicidal activity, and repellent activity against Triatoma rubrofasciata of Severinia monophylla leaf essential oil*, Parasitology Research, 118, 3, 733-742, 2019, Springer Berlin Heidelberg.
- Dosoky, Noura S.; Satyal, Prabodh; and Setzer, William N., *Variations in the Volatile Compositions of Curcuma Species*, Foods, 8, 2, 53, 2019, Multidisciplinary Digital Publishing Institute.
- Hung, Nguyen Huy; Satyal, Prabodh; Hieu, Ho Viet; Chuong, Nguyen Thi Hong; Dai, Do Ngoc; Huong, Le Thi; Tai, Thieu Anh; and Setzer, William N., *Mosquito Larvicidal Activity of the Essential Oils of Erechites Species Growing Wild in Vietnam*, Insects, 10, 2, 47, 2019, Multidisciplinary Digital Publishing Institute.
- Monzote, Lianet; Herrera, Isabel; Satyal, Prabodh; and Setzer, William N., *In-Vitro Evaluation of 52 Commercially-Available Essential Oils Against Leishmania amazonensis*, Molecules, 24, 7, 1248, 2019, Multidisciplinary Digital Publishing Institute.
- Johnson, Stephen; DeCarlo, Anjanette; Satyal, Prabodh; Dosoky, Noura S.; Sorensen, Aaron; and Setzer, William N., *Organic Certification is Not Enough: The Case of the Methoxydecane Frankincense*, Plants, 8, 4, 88, 2019, Multidisciplinary Digital Publishing Institute.
- Gutiérrez, Yamilet I.; Scull, Ramón; Villa, Anabel; Satyal, Prabodh; Cos, Paul; Monzote, Lianet; and Setzer, William N., *Chemical Composition, Antimicrobial and Antiparasitic Screening of the Essential Oil from Phania matricarioides (Spreng.) Griseb.*, Molecules, 24, 8, 1615, 2019, Multidisciplinary Digital Publishing Institute.
- Lawson, Sharp, Powers, McFeeters, Satyal, Setzer: *Volatile Compositions and Antifungal Activities of Native American Medicinal Plants: Focus on the Asteraceae*. Plants 01/2020; 9(1):126., DOI:10.3390/plants9010126
- Nguyen Huy Hung, Le Thi Huong, Nguyen Thanh Chung, Nguyen Thi Hoai Thuong, Prabodh Satyal, Nguyen Anh Dung, Thieu Anh Tai, William N. Setzer: *Callicarpa Species from Central Vietnam: Essential Oil Compositions and Mosquito Larvicidal Activities*. Plants 01/2020; 9(1):113., DOI:10.3390/plants9010113
- Noura S Dosoky, Prabodh Satyal, Luccas M Barata, Joyce Kelly, R Da Silva, William N Setzer: *Volatiles of Black Pepper Fruits (Piper nigrum L.)*. Molecules 11/2019; 24(23):4244., DOI:10.3390/molecules24234244
- Sims K Lawson, Layla G Sharp, Prabodh Satyal, William N Setzer: *Volatile components of the aerial parts of Conoclinium coelestinum from North Alabama*.
- Le Thi Huong, Nguyen Huy Hung, Do Ngoc Dai, Thieu Anh Tai, Vu Thi Hien, Prabodh Satyal, William N. Setzer: *Chemical Compositions and Mosquito Larvicidal Activities of Essential Oils from Piper Species Growing Wild in Central Vietnam*. Molecules 10/2019; 24(21):3871., DOI:10.3390/molecules24213871
- Chelsea N. Powers, Prabodh Satyal, John A. Mayo, Hana McFeeters, Robert L. McFeeters: *Bigger Data Approach to Analysis of Essential Oils and Their Antifungal Activity against Aspergillus niger, Candida albicans, and Cryptococcus neoformans*. Molecules 08/2019; 24(16):2868., DOI:10.3390/molecules24162868
- Sims K. Lawson, Layla G. Sharp, Chelsea N. Powers, Robert L. McFeeters, Prabodh Satyal, William N. Setzer: *Essential Oil Compositions and Antifungal Activity of Sunflower (Helianthus) Species Growing in North Alabama*. Applied Sciences 08/2019; 9(15):3179., DOI:10.3390/app9153179
- Stephen Johnson, Anjanette DeCarlo, Prabodh Satyal, Noura S. Dosoky, Aaron Sorensen, William N. Setzer: *The Chemical Composition of Boswellia occulta Oleogum Resin Essential Oils*. Natural product communications 07/2019; 14(7):1934578X1986630., DOI:10.1177/1934578X19866307
- Nguyen Huy Hung, Prabodh Satyal, Do Ngoc Dai, Thieu Anh Tai, Le Thi Huong, Nguyen Thi Hong Chuong, Ho Viet Hieu, Pham Anh Tuan, Pham Van Vuong, William N. Setzer: *Chemical Compositions of Crassocephalum crepidioides Essential Oils and Larvicidal Activities Against Aedes aegypti, Aedes albopictus, and Culex quinquefasciatus*. Natural product communications 06/2019; 14(6):1934578X1985003., DOI:10.1177/1934578X19850033
- Nguyen Huy Hung, Nguyen Thi Hong Chuong, Prabodh Satyal, Ho Viet Hieu, Do Ngoc Dai, Le Thi Huong, Le Hoang Sinh, Nguyen Thi Bich Ngoc, Vu Thi Hien, William N. Setzer: *Mosquito Larvicidal Activities and Chemical Compositions of the Essential Oils of Leucas Zeylanica Growing Wild in Vietnam*. Natural product communications 06/2019; 14(6):1934578X1984267., DOI:10.1177/1934578X19842675

- Yamilet I. Gutiérrez, Ramón Scull, Anabel Villa, Prabodh Satyal, Paul Cos, Lianet Monzote, William N. Setzer: *Chemical Composition, Antimicrobial and Antiparasitic Screening of the Essential Oil from Phania matricarioides (Spreng.) Griseb.*. *Molecules* 04/2019; 24(8):1615., DOI:10.3390/molecules24081615
- Stephen Johnson, Anjanette Decarlo, Prabodh Satyal, Noura S Dosoky, Aaron Sorensen, William N Setzer: *Organic Certification is Not Enough: The Case of the Methoxydecane Frankincense*. *Plants* 04/2019; 8(4):88., DOI:10.3390/plants8040088
- Lianet Monzote, Isabel Herrera, Prabodh Satyal, William N Setzer: *In-Vitro Evaluation of 52 Commercially-Available Essential Oils Against Leishmania amazonensis*. *Molecules* 03/2019; 24(7):1248., DOI:10.3390/molecules24071248
- Nguyen Hung, Prabodh Satyal, Ho Hieu, Nguyen Chuong, Do Dai, Le Huong, Thieu Tai, William Setzer: *Mosquito Larvicidal Activity of the Essential Oils of Erechites Species Growing Wild in Vietnam*. *Insects* 02/2019; 10(2):47., DOI:10.3390/insects10020047
- Noura S Dosoky, Prabodh Satyal, William N Setzer: *Variations in the Volatile Compositions of Curcuma Species*. 02/2019; 8(2):53., DOI:10.3390/foods8020053
- Prabodh Satyal, Ho Viet Hieu, Nguyen Thi Hong Chuong, Nguyen Huy Hung, Le Hoang Sinh, Pham Van The, Thieu Anh Tai, Vu Thi Hien, William N. Setzer: *Chemical composition, Aedes mosquito larvicidal activity, and repellent activity against Triatoma rubrofasciata of Severinia monophylla leaf essential oil*. *Parasitology Research* 01/2019;., DOI:10.1007/s00436-019-06212-1

Book Chapters

- Prabodh Satyal, William N. Setzer: *Adulteration Analysis in Essential Oils*. *Essential Oil Research, Trends in Biosynthesis, Analytics, Industrial Applications and Biotechnological Production*, 06/2019: pages 261-273; , DOI:10.1007/978-3-030-16546-8_9
- Anjanette DeCarlo, Noura S. Dosoky, Prabodh Satyal, Aaron Sorensen, William N. Setzer: *The Essential Oils of the Burseraceae*. *Essential Oil Research, Trends in Biosynthesis, Analytics, Industrial Applications and Biotechnological Production*, 06/2019: pages 61-145; , DOI:10.1007/978-3-030-16546-8_4

JOURNAL AFFILIATIONS

- Editor Board Member of *International Journal of Professional Holistic Aromatherapy* [2012-present]
- Editor Board Member of *International Journal of Innovations in Pharmaceutical Sciences* [2011-present]
- Editor Board Member of *American Journal of Essential Oils and Natural Products* [2019-present]
- Reviewed Articles from various journals such as *Journal of Natural Product*, *Journal of Essential Oil Research*, *Arabian Journal of Chemistry*, *Hindawis Journal of Oxidative medicine*, *IJPHA*, *Chemical Toxicology*, and *American Chemical Society*.

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UTAH DEPARTMENT OF AGRICULTURE AND FOOD

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CITATION

DATE: August 10th, 2022 **CITATION #**Cann-22-041
NAME: Aaron Sorensen
COMPANY, LICENSE: Aromatic Plant Research Center 7004-21101
ADDRESS: 230 N 1200 E., Suite 100, Lehi UT 84043
PHONE: 812-406-3297
EMAIL: asorensen@aromaticplant.org

Notice of Violation

This is to inform you of a violation of the Utah Agricultural Code described as follows:

R-68-30-13. Violations Categories. 1) Public Safety Violations: \$3,000- \$5,000 per violation. This category is for violations which present a direct threat to public health or safety including:e) failure to comply with testing requirements. On July 11th, the department was informed of Zion Zonuts flower products in pharmacies that had large amounts of seeds. The department pulled a regulatory sample for retesting and it failed for foreign matter due to the seeds present. Based on the retesting of the product it should not have passed the original testing conducted by APRC as it should have failed under adulterants for foreign matter outlined in R68-29-6, Foreign Matter Standards. **FIRST VIOLATION: \$500.00 (fine amount reduced due to not creating a human health hazard)**

DATE OF VIOLATION: July 12th, 2022

LOCATION OF VIOLATION: 230 N 1200 E, Suite 100, Lehi UT 84043

Administrative Order

ORDER:

1. APRC is ordered to pay the fine amount totaling: **\$500.00**
2. APRC will ensure all testing methods meet failure standards as outlined in R68-29.

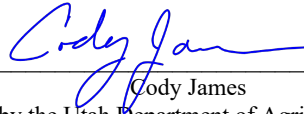
SETTLEMENT FEE:

If paid within 20 days **\$500** 21-40 days **\$1000** After 40 days **\$2000**

Check, credit card or money order to be made payable to the Utah Department of Agriculture and Food. Payments can be mailed to Po Box 146500 Salt Lake City, UT 84114, paid directly at 4315

South 2700 West TSOB South Bldg, Floor 2 Taylorsville, UT 84129-2128. or by calling 801-982-2200.

Program Manager Signature



Cody James

This notification and penalty issued by the Utah Department of Agriculture and Food (UDAF) is a legal order of UDAF. Payment of fees assessed shall be considered settlement for the noted violations. A written letter of contest must be filed with the Commissioner of Agriculture and Food within 20 days of the date of issuance of this notice if the violator wishes to contest this order and/or settlement fee. This order shall become final if no contest is received within 20 days. Any costs incurred by UDAF in enforcing this order after the 20-day period will be paid by the violator. **A civil violation penalty of up to \$5,000 per offense may be issued if a hearing is requested.**



State of Utah

SPENCER J. COX
Governor

Department of Agriculture and Food

CRAIG W. BUTTARS
Commissioner

KELLY PEHRSON
Deputy Commissioner

DEIDRE M. HENDERSON
Lieutenant Governor

November 28, 2022

Aromatic Plant Research Center
License # 7004-21101
Subject: Warning Letter - Case-22-097
CC: Aaron Sorensen

On October 18, 2022, UDAF conducted a compliance inspection at the Aromatic Plant Research Center (APRC). During the Inventory Control requirement portion of the inspection the specialist observed that TN-F-3.5g Mimosa (C), Batch 220411H, had only APRC's internal tag on it, as the sample had been removed from the Mylar bag that had the solo tag and label on it to prepare for destruction in the autoclave. Trainwreck 1G Elite, Batch PR220722I, did have a solo tag on it, but not the label listing the other requirements of rule R68-30-6(4). Samples were observed with a label that did not list the license number of APRC Lab. Also, while reviewing the security requirements portion of the inspection, the visitors log was observed to be missing "purpose of visit" for two recent entries.

This letter constitutes a warning issued pursuant to:

R68-30-6: (4) Each test sample that has been issued a unique identification number shall have a physical tag placed on it with:

- a) the unique identification number;
- b) the license number and name of the lab receiving the test sample;
- c) the license number and name of the cannabis production establishment name;
- d) the date the test sample was collected; and
- e) the weight of the sample

R68-30-5: (10) An independent cannabis testing laboratory shall keep and maintain a visitor's log showing:

- e) the purpose of the visit

Receipt of this warning letter is deemed to constitute knowledge of a violation of R68-30. It is the policy of UDAF to try to obtain voluntary compliance whenever possible.

If voluntary compliance is not obtained, additional regulatory action may be deemed necessary as follows: Pursuant to Utah Code Annotated Section 4-2-12(2): the Department may issue an order for corrective action and request the County Attorney or Attorney General to enforce the Order. Section 4-2-15(1) Utah Code Annotated indicates violators shall be assessed a civil penalty not to exceed \$5,000.00 per violation.

Sincerely,

Cody James
Manager, Industrial Hemp and Medical Cannabis



Department of Agriculture and Food

State of Utah

RAIG W. BUTTARS
Commissioner

SPENCER J. COX
Governor

ELLY PEHRSON
Deputy Commissioner

DEIDRE M. HENDERSON
Lieutenant Governor

April 10th, 2023

Aromatic Research Plant Center
License # 7004-20402
Subject: Case# 23-071

Warning Notice

CC: Aaron Sorenson

On March 28th, UDAF conducted a compliance inspection at APRC testing facility in Lehi, UT. While reviewing the visitor log, UDAF found several sign out times missing on 3/19/23 from Jan Pro cleaning. UDAF also found that Watermelon 20CT Curaleaf product (Batch# PR.230112N-0) was sent to waste on 3/27/23 but was still listed in active inventory on 3/28/23.

This letter constitutes a warning issued pursuant to: **R68-30-5. Security Requirements. (10) An independent cannabis testing laboratory shall keep and maintain a visitor's log showing: d) time of departure. There are three of the sign out times missing.**

This letter also constitutes warning issued pursuant to: **R68-30-6. Inventory Control. (6) The following shall be reconciled in the inventory control system at the close of each business day e) the weight and disposal of cannabis waste materials.**

Receipt of this warning letter is deemed to constitute knowledge of a violation of: R68-30.

APRC will provide information, including their detailed, step by step plan on how to bring the above non-compliance areas into compliance, within 20 days of the date of this letter. Information must be submitted within the 20 days to cannabis@utah.gov.

If information for compliance is not obtained within 20 days, regulatory action may be deemed necessary.

Sincerely,

Cody James
Deputy Director, Industrial Hemp and Medical Cannabis



State of Utah

SPENCER J. COX
Governor

DEIDRE M. HENDERSON
Lieutenant Governor

Department of Agriculture and Food

CRAIG W. BUTTARS
Commissioner

KELLY PEHRSON
Deputy Commissioner

May 15th, 2023

Aromatic Plant Research Center
License # 7004-20402
Subject: Case# 23-087

Warning Notice

CC: Aaron Sorensen

On April 26th, UDAF conducted a compliance inspection at APRC in Lehi, UT. While reviewing laboratory requirements, UDAF found that Isopropyl Alcohol 99% made by Pharmco did not have an SDS from the specific manufacturer but instead a SDS from a different brand. Since ISO certification requires having correct SDS's and SDS's must be from specific manufacturers of the chemical, the SDS was out of compliance.

This letter constitutes a warning issued pursuant to: **R68-30-4. Independent Cannabis Testing Laboratory Requirements. R68-30-4(7) An independent cannabis testing laboratory shall obtain and keep the International Organization for Standardization (ISO) 17025:2017 accreditation.**

Receipt of this warning letter is deemed to constitute knowledge of a violation of: R68-30.

APRC will provide information, including their detailed, step by step plan on how they will come into compliance within 20 days of the date of this letter. Information must be submitted within the 20 days to cannabis@utah.gov.

If information for compliance is not obtained within 20 days, regulatory action may be deemed necessary.

Sincerely,

A handwritten signature in blue ink, appearing to read "Cody James".

Cody James
Deputy Director, Industrial Hemp and Medical Cannabis



State of Utah

SPENCER J. COX
Governor

DEIDRE M. HENDERSON
Lieutenant Governor

Department of Agriculture and Food

CRAIG W. BUTTARS
Commissioner

KELLY PEHRSON
Deputy Commissioner

May 11th, 2022

Aromatic Plant Research Center
License # 7004-21101
Subject: Letter of Concern

CC: Aaron Sorensen

As you are aware UTAH CANN is holding a business conference and expo on May 13th and 14th. It has come to the department's attention that you are listed as a vendor at the event (as noted on their website). Logo placement as a vendor or sponsorship at an event constitutes advertising as outlined in 4-41a-403 and therefore is in violation of the statute since establishments may not advertise to the general public in any medium.

For further questions or clarification please contact us at cannabis@utah.gov

Sincerely,

A handwritten signature in blue ink that reads "Cody James".

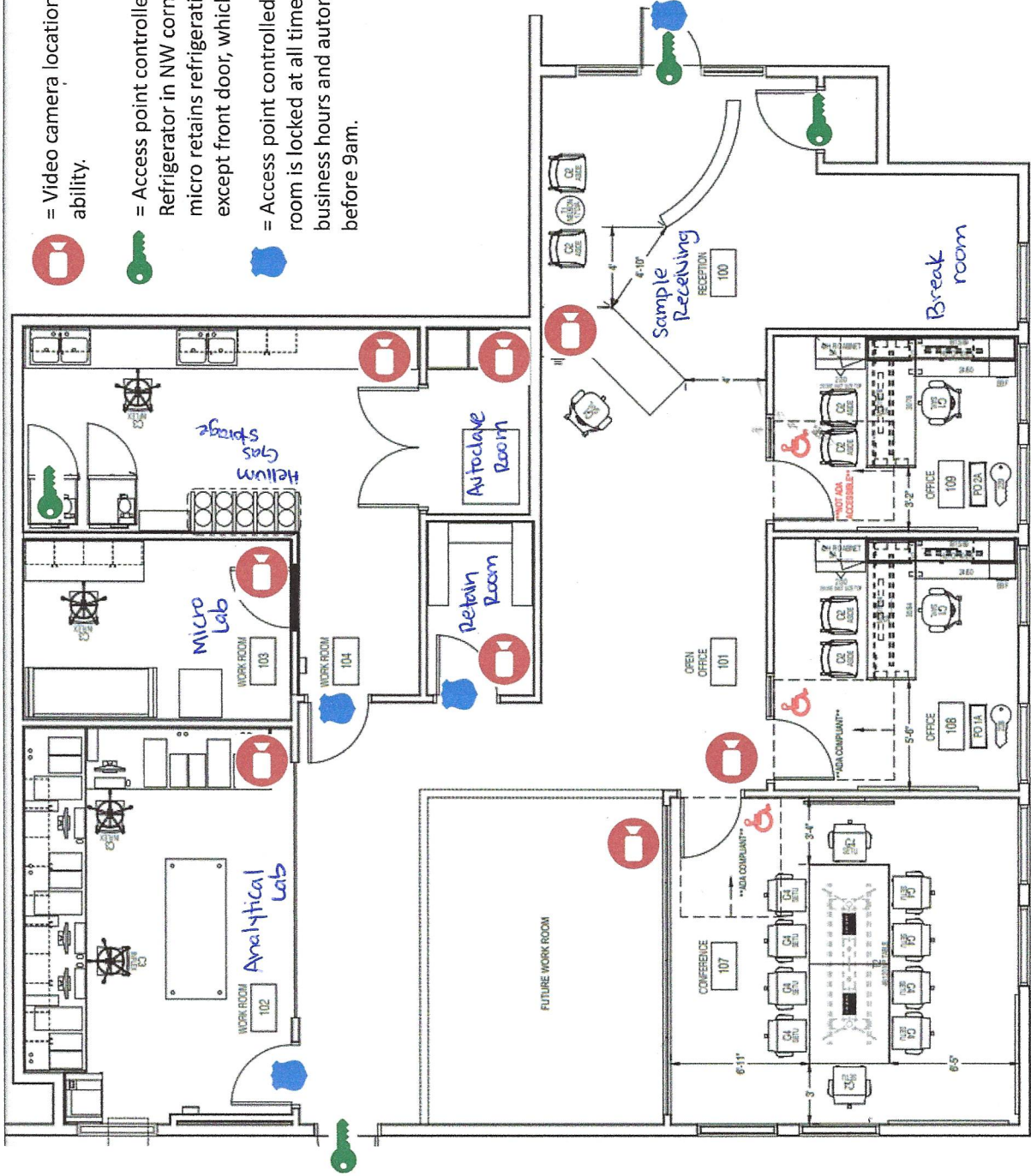
Cody James
Manager, Industrial Hemp and Medical Cannabis

= Video camera location. Cameras have 360° viewing ability.

= Access point controlled by key/lock access.

Refrigerator in NW corner is padlocked and used as micro retains refrigeration. All locks are closed 24/7 except front door, which is open during business hours.

= Access point controlled by card reader/lock. Retains room is locked at all times. All others are open during business hours and automatically locked after 5pm and before 9am.



For the blueprints attached the square-footage of the technical areas is as follows:

Analytical Lab: 251.8 ft²

Micro Lab: 112.6 ft²

Wet Chemistry Lab: 244.9 ft²

Autoclave Room: 48.7 ft²

Secured Retains Room: 48.0 ft²

Aromatic Plant Research Center
230 N 1200 E STE 100
Lehi, UT 84043
www.aromaticplant.org
Revised October 1, 2022



Test Code	Essential Oil Tests	Price
10A	Adulteration detection – GCMS	\$ 200
10B	Allergen identification – GCMS required	\$ 25
10C	ISO/APRC comparison – GCMS required	\$ 25
10D	Physical constants	\$ 50
10E	Chiral GCMS	\$ 200
10F	Pesticide screen (APRC panel)* – LCMS	\$ 250
10G	EO quantitation – GC-FID	\$ 200
10H	Carrier/Pressed Oil Testing	\$ 200

Essential Oil Panel		
80A	Essential Oil Panel Adulteration detection with allergen and ISO/APRC comparison Physical constants Chiral GCMS or GC-FID	\$ 300

Test Code	Microbial Tests (3-5 day turnaround)	Price
60I	Rapid Total Aerobic/Rapid Total Yeast and Mold Quantitative Analysis	\$ 80
60J	DetectX – PCR [∞]	\$ 100

Test Code	Other Tests	Price
70A	Boswellic Acids/Lupeol – HPLC	\$ 100
70B	Distillation [†]	\$ 150
70C	C-14, isotope testing	\$ 600
70D	Mycotoxins	\$ 120

Test Code	Hemp Testing	Price
501A	Hemp Cannabinoid profile – HPLC	\$ 50
501E	Hemp VOC screen (UT state panel) – GCMS	\$ 45
501B	Hemp Terpene analysis – GCMS	\$ 50

Test Code	Utah Hemp Cannabis Panel (Terpene testing can be added for \$50.)	Price
801C	Hemp Concentrate Panel Cannabinoid profile – HPLC Pesticide screen (UT state panel) – LCMS VOC screen (UT state panel) – GCMS Foreign matter screen Heavy Metals (UT state panel) – ICP-MS [‡] Quantitative Microbial Plate count DetectX – PCR Mycotoxin Screen	\$ 440

*The Utah Hemp Cannabis Panel contains all of the tests required for product registration in the state of Utah. If your sample(s) requires a different package of tests, contact us about unique testing and pricing.

Test Code	Medicinal Cannabis Tests	Price
50A	Cannabinoid profile – HPLC (Non-Flower)	\$ 80
50AF	Cannabinoid profile – HPLC (Flower)¥	\$ 100
50B	Terpene analysis – GCMS	\$ 100
50C	Moisture content / water activity	\$ 50
50D	Pesticide screen (UT state panel) – LCMS	\$ 200
50E	VOC screen (UT state panel) – GCMS	\$ 100
50F	Foreign matter screen	\$ 15
50G	Heavy metals (UT state panel) – ICP-MS [‡]	\$ 100

Test Code	Medicinal Cannabis Panels (Terpene testing can be added for \$50.)	Price
80B	Cannabis Flower Panel Cannabinoid profile – HPLC Moisture content / water activity Pesticide screen (UT State panel) – LCMS Foreign matter screen Heavy Metals (UT state panel) – ICP-MS [‡] Quantitative Microbial Plate count DetectX – PCR	\$ 550
80C	Cannabis Concentrate Panel Cannabinoid profile – HPLC Pesticide screen (UT state panel) – LCMS Mycotoxin screen. VOC screen (UT state panel) – GCMS Foreign Matter Screen Heavy Metals (UT state panel) – ICP-MS [‡] Quantitative Microbial Plate count DetectX – PCR	\$ 600
80D	Cannabis Finished Product Panel Cannabinoid profile – HPLC Quantitative Microbial Plate count DetectX – PCR Foreign matter screen	\$ 225
80E	Pre Pack Panel Quantitative Microbial Plate count Foreign matter screen DetectX – PCR	\$ 130

† – Please contact us for a full list of analytes.

‡ – One-week minimum lead time.

∞ – The DetectX PCR test is a qualitative test which tests for several common pathogenic bacteria, including all required microbes for Utah State cannabis regulations.

¥ – All flower cannabinoid HPLC profile tests require moisture content for accurate analysis.


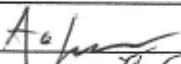

*For priority samples, call ahead for pricing and availability.

SOP Standard Operating Procedure

Aromatic Plant Research Center (APRC), Pleasant Grove, UT 84062

SOP Title APRC lab safety, waste disposal and chemical hygiene plan		SOP Number 1-2003	Version 03
Department Aromatic plant research Center (APRC)	 APRC Aromatic Plant Research Center	Supersedes SOP # N/A	Page 1 of 6

APPROVALS:

Department	Signature	Date
CHIEF SCIENTIFIC OFFICER (CSO)	Prabodh Satyal 	04.15.22
CHIEF EXECUTIVE OFFICER (CEO)	Aaron Sorensen 	4/13/22
ORIGINATOR	William Deutschman 	4/13/22

SOP Standard Operating Procedure

Aromatic Plant Research Center (APRC), Pleasant Grove, UT 84062

SOP Title APRC lab safety, waste disposal and chemical hygiene plan		SOP Number 1-2003	Version 03
Department Aromatic plant research Center (APRC)		Supersedes SOP # N/A	Page 2 of 6

booklet which is located near the door. **Note:** The most up-to-date list of chemicals currently in the lab is the electronic copy stored on the APRC Lab shared drive.

SOP Standard Operating Procedure

Aromatic Plant Research Center (APRC), Pleasant Grove, UT 84062

SOP Title APRC lab safety, waste disposal and chemical hygiene plan		SOP Number 1-2003	Version 03
Department Aromatic plant research Center (APRC)		Supersedes SOP # N/A	Page 3 of 6

- ii. Avoid picking up pieces of broken glass with fingers. Sweep the area around the glass with a broom and collect in a dustpan.

SOP Standard Operating Procedure

Aromatic Plant Research Center (APRC), Pleasant Grove, UT 84062

SOP Title APRC lab safety, waste disposal and chemical hygiene plan		SOP Number 1-2003	Version 03
Department Aromatic plant research Center (APRC)		Supersedes SOP # N/A	Page 4 of 6

F. First Aid/Emergencies

SOP Standard Operating Procedure

Aromatic Plant Research Center (APRC), Pleasant Grove, UT 84062

SOP Title APRC lab safety, waste disposal and chemical hygiene plan		SOP Number 1-2003	Version 03
Department Aromatic plant research Center (APRC)		Supersedes SOP # N/A	Page 5 of 6

1. All plated media with no growth must be placed in an appropriate biohazard trash can.

SOP Standard Operating Procedure

Aromatic Plant Research Center (APRC), Pleasant Grove, UT 84062

SOP Title APRC lab safety, waste disposal and chemical hygiene plan		SOP Number 1-2003	Version 03
Department Aromatic plant research Center (APRC)		Supersedes SOP # N/A	Page 6 of 6

4. When in microbiology lab, take care to notice all the biohazard signs.

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Cannabis testing method by HPLC-PDA		SOP Number 1-2026	Version 03
Department Aromatic Plant Research Center		Supersedes SOP #	Page 1 of 12

APPROVALS:

Department	Signature	Date
CHIEF SCIENTIFIC OFFICER (CSO)	Prabodh Satyal	
CHIEF EXECUTIVE OFFICER (CEO)	Aaron Sorensen	
ORIGINATOR	William Deutschman	

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Cannabis testing method by HPLC-PDA		SOP Number 1-2026	Version 03
Department Aromatic Plant Research Center		Supersedes SOP #	Page 4 of 12

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Cannabis testing method by HPLC-PDA		SOP Number 1-2026	Version 03
Department Aromatic Plant Research Center		Supersedes SOP #	Page 5 of 12

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Cannabis testing method by HPLC-PDA		SOP Number 1-2026	Version 03
Department Aromatic Plant Research Center		Supersedes SOP #	Page 6 of 12

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Cannabis testing method by HPLC-PDA		SOP Number 1-2026	Version 03
Department Aromatic Plant Research Center		Supersedes SOP #	Page 7 of 12

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Cannabis testing method by HPLC-PDA		SOP Number 1-2026	Version 03
Department Aromatic Plant Research Center		Supersedes SOP #	Page 8 of 12

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Cannabis testing method by HPLC-PDA		SOP Number 1-2026	Version 03
Department Aromatic Plant Research Center		Supersedes SOP #	Page 9 of 12

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Cannabis testing method by HPLC-PDA		SOP Number 1-2026	Version 03
Department Aromatic Plant Research Center		Supersedes SOP #	Page 10 of 12

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Cannabis testing method by HPLC-PDA		SOP Number 1-2026	Version 03
Department Aromatic Plant Research Center		Supersedes SOP #	Page 11 of 12


SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Cannabis testing method by HPLC-PDA		SOP Number 1-2026	Version 03
Department Aromatic Plant Research Center		Supersedes SOP #	Page 12 of 12

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Residual Solvent Testing by GCMS		SOP Number 1-2027	Version 03
Department Aromatic Plant Research Center	 APRC Aromatic Plant Research Center	Supersedes SOP # 1-2027.01	Page 1 of 7

APPROVALS:

Department	Signature	Date
CHIEF SCIENTIFIC OFFICER (CSO)	Prabodh Satyal <i>Prabodh Satyal</i>	04.01.2022
CHIEF EXECUTIVE OFFICER (CEO)	Aaron Sorensen <i>Aaron Sorensen</i>	3/24/22
ORIGINATOR	William Deutschman <i>will Deutschman</i>	3/14/22

CURRENT RELEASE:

Information contained herein is proprietary information to be kept privileged and confidential and may not be copied, stored electronically, otherwise disclosed to any person without Aromatic Plant Research Center management consent.

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Residual Solvent Testing by GCMS		SOP Number 1-2027	Version 03
Department Aromatic Plant Research Center		Supersedes SOP # 1-2027.01	Page 3 of 7

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Residual Solvent Testing by GCMS		SOP Number 1-2027	Version 03
Department Aromatic Plant Research Center	 APRC <small>Aromatic Plant Research Center</small>	Supersedes SOP # 1-2027.01	Page 4 of 7

IV.2.7. Vials Cartridges

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Residual Solvent Testing by GCMS		SOP Number 1-2027	Version 03
Department Aromatic Plant Research Center	 APRC [®] <small>Aromatic Plant Research Center</small>	Supersedes SOP # 1-2027.01	Page 5 of 7

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Residual Solvent Testing by GCMS		SOP Number 1-2027	Version 03
Department Aromatic Plant Research Center	 APRC <small>Aromatic Plant Research Center</small>	Supersedes SOP # 1-2027.01	Page 6 of 7

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Residual Solvent Testing by GCMS		SOP Number 1-2027	Version 03
Department Aromatic Plant Research Center	 APRC <small>Aromatic Plant Research Center</small>	Supersedes SOP # 1-2027.01	Page 7 of 7

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

	SOP Title Terpene Quantitation by GCMS	SOP Number 1-2029	Version 03
	Department Aromatic Plant Research Center	 Supersedes SOP #	Page 1 of 8

APPROVALS:

Department	Signature	Date
CHIEF SCIENTIFIC OFFICER (CSO)	Prabodh Satyal	
CHIEF EXECUTIVE OFFICER (CEO)	Aaron Sorensen	
ORIGINATOR	William Deutschman	

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

	SOP Title Terpene Quantitation by GCMS	SOP Number 1-2029	Version 03
	Department Aromatic Plant Research Center	 Supersedes SOP #	Page 3 of 8

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

	SOP Title Terpene Quantitation by GCMS	SOP Number 1-2029	Version 03
	Department Aromatic Plant Research Center	 Supersedes SOP #	Page 4 of 8

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

	SOP Title Terpene Quantitation by GCMS	SOP Number 1-2029	Version 03
	Department Aromatic Plant Research Center	 Supersedes SOP #	Page 5 of 8


SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

	SOP Title Terpene Quantitation by GCMS	SOP Number 1-2029	Version 03
	Department Aromatic Plant Research Center	 Supersedes SOP #	Page 6 of 8

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

	SOP Title Terpene Quantitation by GCMS	SOP Number 1-2029	Version 03
	Department Aromatic Plant Research Center	 Supersedes SOP #	Page 7 of 8


SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

	SOP Title Terpene Quantitation by GCMS	SOP Number 1-2029	Version 03
	Department Aromatic Plant Research Center	 Supersedes SOP #	Page 8 of 8

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Water Activity Testing		SOP Number 1-2031	Version 01
Department Aromatic Plant Research Center		 Supersedes SOP # Page 1 of 3	

(METER Aqualab Disposable Sample Cups)**APPROVALS:**

Department	Signature	Date
CHIEF SCIENTIFIC OFFICER (CSO)	Prabodh Satyal	
CHIEF EXECUTIVE OFFICER (CEO)	Aaron Sorensen	
ORIGINATOR	William Deutschman	

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Water Activity Testing		SOP Number 1-2031	Version 01
Department Aromatic Plant Research Center		Supersedes SOP #	Page 3 of 3



SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title		SOP Number	Version
Moisture Content Testing		1-2032	01
Department	 APRC Aromatic Plant Research Center	Supersedes SOP #	
Aromatic Plant Research Center		Page 1 of 2	

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

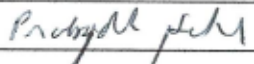
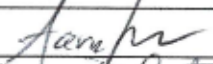
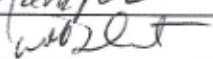
SOP Title		SOP Number	Version
Moisture Content Testing		1-2032	01
Department	 APRC Aromatic Plant Research Center	Supersedes SOP #	
Aromatic Plant Research Center		Page 2 of 2	

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Microbial Screening by PCR		SOP Number 1-2033	Version 03
Department Aromatic Plant Research Center		Supersedes SOP # N/A	Page 1 of 9

APPROVALS:

Department	Signature	Date
CHIEF SCIENTIFIC OFFICER (CSO)	Prabodh Satyal 	04.01.2022
CHIEF EXECUTIVE OFFICER (CEO)	Aaron Sorensen 	3/24/22
ORIGINATOR	William Deutschman 	3/19/22

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Microbial Screening by PCR		SOP Number 1-2033	Version 03
Department Aromatic Plant Research Center		Supersedes SOP # N/A	Page 3 of 9

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Microbial Screening by PCR		SOP Number 1-2033	Version 03
Department Aromatic Plant Research Center		Supersedes SOP # N/A	Page 4 of 9

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Microbial Screening by PCR		SOP Number 1-2033	Version 03
Department Aromatic Plant Research Center		Supersedes SOP # N/A	Page 5 of 9

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Microbial Screening by PCR		SOP Number 1-2033	Version 03
Department Aromatic Plant Research Center		Supersedes SOP # N/A	Page 6 of 9

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Microbial Screening by PCR		SOP Number 1-2033	Version 03
Department Aromatic Plant Research Center		Supersedes SOP # N/A	Page 7 of 9

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Microbial Screening by PCR		SOP Number 1-2033	Version 03
Department Aromatic Plant Research Center		Supersedes SOP # N/A	Page 8 of 9


SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Microbial Screening by PCR		SOP Number 1-2033	Version 03
Department Aromatic Plant Research Center		Supersedes SOP # N/A	Page 9 of 9

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title Microbial Screening by Plate Counting		SOP Number 1-2034	Version 01
Department Aromatic Plant Research Center	 APRC [®] <small>Aromatic Plant Research Center</small>	Supersedes SOP # N/A	Page 1 of 3

APPROVALS:

Department	Signature	Date
CHIEF SCIENTIFIC OFFICER (CSO)	Prabodh Satyal <i>Prabodh Satyal</i>	2.14.22
CHIEF EXECUTIVE OFFICER (CEO)	Aaron Sorensen <i>Aaron Sorensen</i>	2/11/22
ORIGINATOR	William Deutschman <i>W.D.</i>	2/11/22

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title		SOP Number	Version
Microbial Screening by Plate Counting		1-2034	01
Department	Supersedes SOP #	Page 3 of 3	
Aromatic Plant Research Center 	N/A		

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title		SOP Number	Version
Foreign Matter Testing		1-2047	02
Department	 APRC Aromatic Plant Research Center	Supersedes SOP #	Page 1 of 2
Aromatic Plant Research Center		N/A	

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title		SOP Number	Version
Foreign Matter Testing		1-2047	02
Department	 APRC Aromatic Plant Research Center	Supersedes SOP #	Page 2 of 2
Aromatic Plant Research Center		N/A	

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title		SOP Number	Version
Client Retest Requests		1-2048	02
Department		Supersedes SOP #	Page 1 of 3
Aromatic Plant Research Center		N/A	

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title		SOP Number	Version
Client Retest Requests		1-2048	02
Department		Supersedes SOP #	Page 2 of 3
Aromatic Plant Research Center		N/A	

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title		SOP Number	Version
Client Retest Requests		1-2048	02
Department	 APRC Aromatic Plant Research Center	Supersedes SOP #	Page 3 of 3
Aromatic Plant Research Center		N/A	

SOP Standard Operating Procedure

Aromatic Plant Research Center (APRC), Pleasant Grove, UT 84062

SOP Title APRC Lehi Lab Security		SOP Number 1-2100.02	Version 02
Department Aromatic plant research Center (APRC)		Supersedes SOP # N/A	Page 1 of 4

APPROVALS:

Department	Signature	Date
CHIEF SCIENTIFIC OFFICER (CSO)	Prabodh Satyal	
CHIEF EXECUTIVE OFFICER (CEO)	Aaron Sorensen	
ORIGINATOR	William Deutschman	

CURRENT RELEASE:

Owner/Originator William Deutschman	Owner Department APRC	10/28/2021	Change Control Number
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SOP Standard Operating Procedure

Aromatic Plant Research Center (APRC), Pleasant Grove, UT 84062

SOP Title APRC Lehi Lab Security		SOP Number 1-2100.02	Version 02
Department Aromatic plant research Center (APRC)	 APRC <small>Aromatic Plant Research Center</small>	Supersedes SOP # N/A	Page 3 of 4

- iii. All badging access is granted and maintained by the external security provider

SOP Standard Operating Procedure


Aromatic Plant Research Center (APRC), Pleasant Grove, UT 84062

SOP Title APRC Lehi Lab Security		SOP Number 1-2100.02	Version 02
Department Aromatic plant research Center (APRC)	 APRC [®] <small>Aromatic Plant Research Center</small>	Supersedes SOP # N/A	Page 4 of 4

Appendix A

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043


SOP Title		SOP Number	Version
Sample Handling: Receiving, Inventory, Storage, and Retains		1-2101	06
Department		Supersedes SOP #	Page 1 of 6
Aromatic Plant Research Center		N/A	

APPROVALS:

Department	Signature	Date
CHIEF SCIENTIFIC OFFICER (CSO)	Prabodh Satyal	
CHIEF EXECUTIVE OFFICER (CEO)	Aaron Sorensen	
ORIGINATOR	William Deutschman	


SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title		SOP Number	Version
Sample Handling: Receiving, Inventory, Storage, and Retains		1-2101	06
Department	 APRC Aromatic Plant Research Center	Supersedes SOP #	Page 3 of 6
Aromatic Plant Research Center		N/A	

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title		SOP Number	Version
Sample Handling: Receiving, Inventory, Storage, and Retains		1-2101	06
Department		Supersedes SOP #	Page 4 of 6
Aromatic Plant Research Center		N/A	

SOP Standard Operating Procedure

Aromatic Plant Research Center, Lehi, 84043

SOP Title		SOP Number	Version
Sample Handling: Receiving, Inventory, Storage, and Retains		1-2101	06
Department	Supersedes SOP #	Page 5 of 6	
Aromatic Plant Research Center	N/A		





PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

Perry Johnson Laboratory Accreditation, Inc. has assessed the Laboratory of:

Aromatic Plant Research Center

230 N 1200 E, Suite 100, Lehi, UT 84043

*(Hereinafter called the Organization) and hereby declares that Organization is accredited
in accordance with the recognized International Standard:*

ISO/IEC 17025:2017

This accreditation demonstrates technical competence for a defined scope and the
operation of a laboratory quality management system
(as outlined by the joint ISO-ILAC-IAF Communiqué dated April 2017):

Scope Statement
(As detailed in the supplement)

Accreditation claims for such testing and/or calibration services shall only be made from addresses referenced within this certificate. This Accreditation is granted subject to the system rules governing the Accreditation referred to above, and the Organization hereby covenants with the Accreditation body's duty to observe and comply with the said rules.

For PJLA:

Tracy Szerszen
President

Initial Accreditation Date:

May 20, 2022

Issue Date:

May 20, 2022

Expiration Date:

August 31, 2024

Accreditation No.:

115229

Certificate No.:

L22-380

Perry Johnson Laboratory
Accreditation, Inc. (PJLA)
755 W. Big Beaver, Suite 1325
Troy, Michigan 48084

*The validity of this certificate is maintained through ongoing assessments based on a
continuous accreditation cycle. The validity of this certificate should be
confirmed through the PJLA website: www.pjilabs.com*



Certificate of Accreditation: Supplement

Aromatic Plant Research Center

230 N 1200 E, Suite 100, Lehi, UT 84043

Contact Name: William Deutschmna Phone: (385) 484-8302

Accreditation is granted to the facility to perform the following testing:

FIELD OF TEST	ITEMS, MATERIALS OR PRODUCTS TESTED	SPECIFIC TESTS OR PROPERTIES MEASURED	SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED	RANGE (WHERE APPROPRIATE) AND DETECTION LIMIT
Microbiological ^F	Quantitative Microbial Assay of Cannabis and Cannabis Related Products, and Hemp and Hemp Related Products	Total Aerobic Bacterial Content	Hardy Diagnostic Plates – APRC Method 1-2034	10 CFU/g to 1 000 000 CFU/g
		Total Yeast and Mold	Hardy Diagnostic Plates – APRC Method 1-2034	
Chemical ^F	Cannabis and Cannabis Related Products, and Hemp and Hemp Related Products	Water Activity	Water Activity Meter APRC Method 1-2031	0.26 a _w to 1.0 a _w
		Moisture Content	Moisture Analyzer APRC Method 1-2032	0 to 100% by mass
	Quantitative Chemical Assay of Cannabis and Cannabis Related Products, and Hemp and Hemp Related Products	Cannabinoids: CBDV CBDA CBGA CBG CBD THCV CBN delta-9 THC delta-8 THC THCA-A CBC	HPLC/DAD APRC Method 1-2034	0.01% to 100% by mass
		Terpenes: alpha-pinene camphene beta-pinene myrcene delta 3-carene alpha-terpinene para-cymene limonene cis-beta ocimene trans-beta ocimene gamma-terpinene terpinolene linalool isopulegol geraniol beta-caryophyllene alpha-humulene cis-nerolidol trans-nerolidol guaiol alpha-bisabolol	GC/MS APRC Method 1-2029	> 0.001% by mass



Certificate of Accreditation: Supplement

Aromatic Plant Research Center

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Contact Name: William Deutschmna Phone: (385) 484-8302

Accreditation is granted to the facility to perform the following testing:

FIELD OF TEST	ITEMS, MATERIALS OR PRODUCTS TESTED	SPECIFIC TESTS OR PROPERTIES MEASURED	SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED	RANGE (WHERE APPROPRIATE) AND DETECTION LIMIT
Chemical ^F	Quantitative Chemical Assay of Cannabis and Cannabis Related Products, Hemp and Hemp Related Products, and Essential Oils	Residual Solvents: 1,2-Dimethoxyethane 1,4-Dioxane 1-Butanol 1-Propanol 2-Butanol 2-Butanone 2-Ethoxyethanol 2-Propanol Acetone Acetonitrile Benzene Butane Cumene Cyclohexane Dichloromethane 2,2-Dimethylbutane 2,3-Dimethylbutane o-Xylene m,p-Xylene Dimethyl Sulfoxide (DMSO) Ethanol Ethyl Acetate Ethyl Benzene Ethyl Ether Ethylene Glycol Ethylene Oxide Heptane n-Hexane Isopropyl Acetate Methyl Propane 2-Methyl Pentane 3-Methyl Pentane N,N-dimethylacetamide N,N-dimethylformamide Pentane Propane Pyridine Sulfolane Tetrahydrofuran Toluene Xylenes	GC/MS APRC Method 1-2027	> 0.001% by mass



Certificate of Accreditation: Supplement

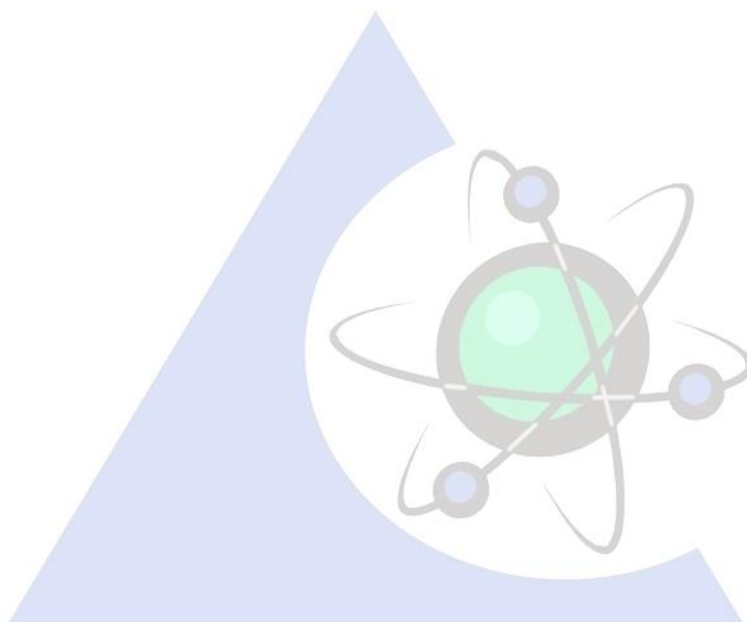
Aromatic Plant Research Center

230 N 1200 E, Suite 100, Lehi, UT 84043

Contact Name: William Deutschmna Phone: (385) 484-8302

Accreditation is granted to the facility to perform the following testing:

1. The presence of a superscript F means that the laboratory performs testing of the indicated parameter at its fixed location. Example: Outside Micrometer^F would mean that the laboratory performs this testing at its fixed location.





Bond No. 810004939

Medical Cannabis Testing Laboratory PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WE, Aromatic Plant Research Center, as Principal, and Atlantic Specialty Insurance Company, a New York Corporation and being duly authorized to transact business of indemnity and suretyship in this state, with its principal office at 605 Highway 169 North, Suite 800, Plymouth, MN 55441, as Surety, are held and firmly bound and do hereby acknowledge our indebtedness to the State of Utah, Department of Agriculture and Food, as Obligee, in the sum of Fifty Thousand and 00/100 Dollars (\$50,000.00) for which payment well and truly to be made, we bind ourselves, our personal representatives, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the condition of this obligation is such that the Principal is obtaining a license from the Utah Department of Agriculture and Food to carry on business as a Cannabis Testing Laboratory.

WHEREAS, the Principal is required to comply with the requirements of Utah Code Title 4, Chapter 41a, Part 1 Cannabis Production Establishments, specifically Utah Code § 4-41a-201 (2) (b) (iv) (A) and is therefore posting this Bond.

LIABILITY for the payment of this sum, to which we hereby obligate and bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, becomes effective upon the following conditions:

1. Registration/licensing of the Principal to conduct business in this state as a Cannabis Testing Laboratory Facility;
2. Failure by the Principal to strictly comply with all applicable provisions of, and orders, rules and regulations issued pursuant to, Utah Code Title 4, Chapter 41a.

THIS BOND shall expire at such time at the Principal's registration/licensing is withdrawn, terminates through non-renewal or non-issue, or is revoked by the Obligee except as to liability for acts or omissions which occur prior to such time. This Bond may also be canceled by the Surety upon 30 days written notice to the Principal and the Obligee.

NO suit may be maintained to enforce any liability arising under this Bond unless brought within one (1) years after discovery of the act or omission upon which liability is based.

IT is understood and agreed that any person(s) having a claim under the conditions of this obligation may initiate suit in any court of competent jurisdiction against the Principal and/or the Aurety upon this Bond.

Signed, sealed and dated this 20th, day of April, 2020.

Aromatic Plant Research Center

Principal

By: Aaron Sorensen

Atlantic Specialty Insurance Company

Surety

By: Susan J. Lattarulo
Susan J. Lattarulo, Attorney-in-Fact



Power of Attorney

KNOW ALL MEN BY THESE PRESENTS, that ATLANTIC SPECIALTY INSURANCE COMPANY, a New York corporation with its principal office in Plymouth, Minnesota, does hereby constitute and appoint: **Sheila J. Montoya, John Browning, Justin Tomlin, Thomas F McCoy Jr, Kelli E Housworth, Susan J Lattarulo**, each individually if there be more than one named, its true and lawful Attorney-in-Fact, to make, execute, seal and deliver, for and on its behalf as surety, any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof; provided that no bond or undertaking executed under this authority shall exceed in amount the sum of: **sixty million dollars (\$60,000,000)** and the execution of such bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof in pursuance of these presents, shall be as binding upon said Company as if they had been fully signed by an authorized officer of the Company and sealed with the Company seal. This Power of Attorney is made and executed by authority of the following resolutions adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the President, any Senior Vice President or Vice-President (each an "Authorized Officer") may execute for and in behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and affix the seal of the Company thereto; and that the Authorized Officer may appoint and authorize an Attorney-in-Fact to execute on behalf of the Company any and all such instruments and to affix the Company seal thereto; and that the Authorized Officer may at any time remove any such Attorney-in-Fact and revoke all power and authority given to any such Attorney-in-Fact.

Resolved: That the Attorney-in-Fact may be given full power and authority to execute for and in the name and on behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and any such instrument executed by any such Attorney-in-Fact shall be as binding upon the Company as if signed and sealed by an Authorized Officer and, further, the Attorney-in-Fact is hereby authorized to verify any affidavit required to be attached to bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof.

This power of attorney is signed and sealed by facsimile under the authority of the following Resolution adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the signature of an Authorized Officer, the signature of the Secretary or the Assistant Secretary, and the Company seal may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing an Attorney-in-Fact for purposes only of executing and sealing any bond, undertaking, recognizance or other written obligation in the nature thereof, and any such signature and seal where so used, being hereby adopted by the Company as the original signature of such officer and the original seal of the Company, to be valid and binding upon the Company with the same force and effect as though manually affixed.

IN WITNESS WHEREOF, ATLANTIC SPECIALTY INSURANCE COMPANY has caused these presents to be signed by an Authorized Officer and the seal of the Company to be affixed this twenty-ninth day of April, 2019.

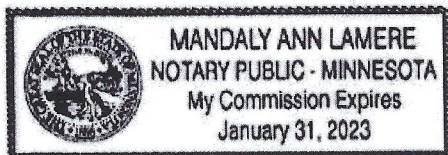


By

Paul J. Brehm, Senior Vice President

STATE OF MINNESOTA
HENNEPIN COUNTY

On this twenty-ninth day of April, 2019, before me personally came Paul J. Brehm, Senior Vice President of ATLANTIC SPECIALTY INSURANCE COMPANY, to me personally known to be the individual and officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, and being by me duly sworn, that he is the said officer of the Company aforesaid, and that the seal affixed to the preceding instrument is the seal of said Company and that the said seal and the signature as such officer was duly affixed and subscribed to the said instrument by the authority and at the direction of the Company.



Notary Public

I, the undersigned, Secretary of ATLANTIC SPECIALTY INSURANCE COMPANY, a New York Corporation, do hereby certify that the foregoing power of attorney is in full force and has not been revoked, and the resolutions set forth above are now in force.

Signed and sealed. Dated 20th day of April, 2020.

This Power of Attorney expires
January 31, 2023



Christopher V. Jerry, Secretary

CERTIFICATE OF LICENSE

The person, firm or corporation below named is hereby granted license (pursuant to the provisions of License Ordinance of Lehi City) to engage in, carry on or conduct, in the City of Lehi, the business, trade, calling, profession, exhibition, or avocation described as follows:

Aromatic Plant Research Center, LLC

230 North 1200 East #100

Lehi UT 84043

Is licensed to do business as:

Research

Mark Johnson *Teisha Wilson*
Mayor Lehi City Recorder

This certificate must be displayed in a conspicuous place



153 North 100 East
Lehi, Utah 84043
(385) 201-1000

Expires: 12/31/2023

License No.: 6985

Date of Issue: 01/01/2023



CERTIFICATE OF LICENSE

The person, firm or corporation below named is hereby granted license (pursuant to the provisions of License Ordinance of Lehi City) to engage in, carry on or conduct, in the City of Lehi, the business, trade, calling, profession, exhibition, or avocation described as follows:

Aromatic Plant Research Center, LLC

230 North 1200 East #100

Lehi UT 84043

Is licensed to do business as:

Research

Mark Johnson *Teisha Wilson*

Mayor

Lehi City Recorder

This certificate must be displayed in a conspicuous place



153 North 100 East
Lehi, Utah 84043
(385) 201-1000

Expires: 12/31/2023

License No.: 6985

Date of Issue: 01/01/2023

COPY



Operation Change Request Form

In accordance to R68-31 Change Requests may go before the Cannabis Establishment Licensing Board for final approval. Please do **ONE** request per form.

Cannabis Facility	Aromatic Plant Research Center
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Change Request Information

Contact Name	Aaron Sorensen	Contact Phone	812-406-3297
Contact Email	asorensen@aromaticplant.org	Date submitted	3/14/2023

Company Representative(s) to be Present at Licensing Board	1.Aaron Sorensen 2.Will Deutschman
--	---------------------------------------

Change Request Details (Select Area of Change)			
New Owner/ Financial Backing	<input type="checkbox"/>	Change in Production SOPs	<input type="checkbox"/>
Change in Facility Name	<input type="checkbox"/>	Change in Extraction SOPs	<input type="checkbox"/>
Change in Location/ Additional Location	<input type="checkbox"/>	Change in Type of Products being Produced	<input type="checkbox"/>
Alteration to Facility Blueprint	<input type="checkbox"/>	Change in Production Yield	<input type="checkbox"/>
Change in Building Sq. Ft.	<input type="checkbox"/>	Changes/ Addition of Outdoor Grow	<input type="checkbox"/>
Change in Science Director	<input type="checkbox"/>	Change in equipment	<input type="checkbox"/>
Other: Update to Lab SOPs			

Will this Change the biomass or product yield?	<input type="checkbox"/> Yes	X No
Explain: APRC doesn't do production of products		

Summary of Proposed Change (This Statement will be read at the public Licensing Board Meeting)
<p>Company's Statement: 5 SOP went through 5 minor updates. Here is a list of the SOPs and the updates made:</p> <p>SOP 1-2026 V3 Cannabis testing method by HPLC-PDA: Description of change: Expanded analytes to 15. Corrected volume used in making dilutions. Change effective 1/11/2023</p> <p>SOP 1-2047 V2 Foreign Matter Testing: Description of change: Updated foreign matter definition. Added info about logging results. Change effective 8/29/2022</p> <p>SOP 1-2048 V2 Client Retest Requests: Description of change: Clarified re-test policy for medicinal samples that fail compliance testing. Change effective 1/11/23</p> <p>SOP 1-2101 V6 Sample Handling: Receiving, Inventory, Storage, and Retains: Description of change: Updated to clarify labeling of incoming medicinal Samples. Change effective: 1/11/23</p> <p>SOP 1-2029 V3 Terpene Quantitation by GCMS. Description of change: Expanded list of analytes, added new check standards and internal standard. Updated GC oven profile. 3/14/22</p>

Submit a Change Request Application. Please include All information from the checklist that will be affected.		
1. Date Changes should go into effect Listed above for each SOP	6. Credentials of new owner(s) / Science Director NA	11. New Extraction SOPs NA
2. New Address NA	7. Change to Storage Plan NA	12. New Grow SOPs NA
3. Submit New Owner Background Information NA	8. Change(s) to Emergency Protocol NA	13. Will this affect getting ISO Certified NO
4. New Building Blueprints NA	9. Changes to Security Plan NA	14. Will this require Industrial Hemp to be brought in? NO
5. New Business License From City NA	10. New Disposal Plan NA	

Attach All Needed Documents: